

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-253607

(43)Date of publication of application : 10.09.2002

(51)Int.Cl.

A61F 13/49

A44B 18/00

A61F 13/56

(21)Application number : 2001-109227

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(22)Date of filing : 03.03.2001

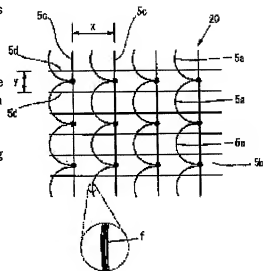
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## (54) PAPER DIAPER HAVING FRONT SHEET FOR FASTENING

(57)Abstract:

PROBLEM TO BE SOLVED: To make a target easily visible at a base material part of hook receiving elements in a paper diaper using a surface fastener tape as a fastening means thereof.

SOLUTION: Hook receiving elements engaged with or disengaged from hook elements of a surface fastener are so arranged as to comprise a base material part having a target visually recognizable from the surface side and a plurality of loops 5a, etc., fixed on the surface of the base material part 5b; the loops 5a, etc., are formed using filament yarns straight or curved gently obtained by the non-crimp finishing.



## LEGAL STATUS

[Date of request for examination]

29.06.2005

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's  
decision of rejection]

[Date of extinction of right]

(51) Int.Cl. <sup>7</sup>	識別記号	F I	テマコード <sup>7</sup> (参考)
A 6 1 F 13/49		A 4 4 B 18/00	3 B 0 2 9
A 4 4 B 18/00		A 4 1 B 13/02	H 3 B 1 0 0
A 6 1 F 13/56			

審査請求 未請求 請求項の数16 書面 (全 18 頁)

(21) 出願番号 特願2001-109227(P2001-109227)

(22) 出願日 平成13年3月3日 (2001.3.3)

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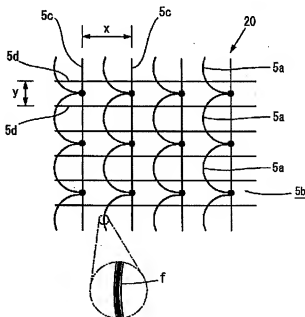
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(54) 【発明の名称】 止着用フロントシートを有する紙おむつ

## (57) 【要約】

【課題】面ファスナーテープを紙おむつの止着手段とするものにおいて、フック受け要素の基材部のターゲットを見易くする。

【解決手段】面ファスナーのフック要素と係脱するフック受け要素を、表面側から視認可能なターゲットを有する基材部と、この基材部5bの表面に固定された多数のループ5a、5a…とからなるものとともに、各ループ5a、5a…を未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸により形成する。



## 【特許請求の範囲】

【請求項 1】 フック要素とこれと係脱自在の関係を有するフック要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された多数のループとからなり、

各前記ループが、真直ぐなまたは緩やかにカーブしたフィラメント糸から形成された、

ことを特徴とする止着用フロントシートを有する紙おむつ。

【請求項 2】 前記ループの数密度が  $10 \sim 60$  個/cm<sup>2</sup> とされた、請求項 1 記載の止着用フロントシートを有する紙おむつ。

【請求項 3】 フック要素とこれと係脱自在の関係を有するフック要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された、多数のループが膨出するように編成された格子網状体とからなり、

前記ループを含む格子網状体が、真直ぐなまたは緩やかにカーブしたフィラメント糸から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

【請求項 4】 前記ループの数密度が  $10 \sim 60$  個/cm<sup>2</sup> とされるときに、前記格子網状体における縦糸部分間隔が  $1.5$  mm 以下とされ、且つ横糸部分間隔が  $3.0$  mm 以下とされた、請求項 3 記載の止着用フロントシートを有する紙おむつ。

【請求項 5】 前記フック受け要素を平面的に見たときに、前記ループの  $60\%$  以上が所定の同一方向に膨出して見える形態をなしている、請求項 1～4 のいずれか 1 項に記載の紙おむつ。

【請求項 6】 前記フック受け要素単体の光透過率が  $60\%$  以下とされた、請求項 1～5 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 7】 前記ループを、ポリウレタン系接着剤により前記基材部に固定した、請求項 1～6 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 8】 前記ターゲットが、胴回り方向に異なる複数の止着位置を表すデザインのものでされた、請求項 1～7 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 9】 前記基材部に対するターゲットが、グラビア印刷またはフレキシ印刷により形成された、請求項 1

～8 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 10】 セン断強度試験方法による、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを両表面に沿う方向に相対的にずらすのに要する力として定まる、せん断力が  $100$  g 以上であり、剥離強度試験方法による、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを両表面に直交する方向に引き剥がすのに要する力として定まる、剥離力が  $10$  g 以上である、請求項 1～9 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 11】 相互に止着された前記フック要素と前記フック受け要素とを剥離した時の音が  $15.0$  ソーン以下である、請求項 1～10 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 12】 前記フック受け要素が、JIS-P-8117：ガーレー法による透気性が、 $9.0$  sec/ $100$  ml 以上のものとされた、請求項 1～11 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 13】 前記フック受け要素が、JIS-L-1099：MVT 法による透湿性が、 $500$  g/m<sup>2</sup>・d 以上のものとされた、請求項 1～12 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 14】 前記ループを有するフック受け要素表面に対して起毛処理を施した、請求項 1～12 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 15】 各ループが、未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸から形成されている請求項 1～14 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

【請求項 16】 フィラメント糸の材質がナイロンである請求項 1～15 のいずれか 1 項に記載の止着用フロントシートを有する紙おむつ。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】 本発明は、フック要素とフック受け要素との係合を行う着脱自在の面ファスナー（通常ベルクロファスナー（登録商標）またはマジックテープ（登録商標）と呼ばれる）を用いて装着するようにした紙おむつに関する。

## 【0002】

【従来の技術】 一般に、紙おむつを被着用者に装着する場合のテープファスナーとしては、粘着剤を用いたものが主流をなしている。おむつかバーにおいては、前述の面ファスナーにて結合するようになっている。この面ファスナーを用いる場合、何回もの着脱が可能であり便利である。これに対して、粘着テープファスナーを紙おむつの両側部に固定し、紙おむつの腹側のバックシート表面に大きい面積をもってフロントシートを固定し、このフ

ロントシートに対して粘着テープファスナーを止着し、取付位置を調整し直すことが可能な構造のものが汎用されている。この場合、粘着テープファスナーの止着位置の便宜のために、フロントテープの腹回り方向に間隔を置いてターゲット（目印）を印刷により形成したものが知られている。フロントシートに対して粘着テープファスナーを止着するようにした構造のものは、テープファスナーの取付位置が調整可能である利点があるものの、着用後一旦剥がし、排尿の有無を確認した後、再度、フロントシートに固定する場合、粘着剤の止着強度が低下する。さらに、元来、粘着剤による接着強度に頼るために、たとえば大きい面積を有する成人用の紙おむつにおいては強度不足となり、剥がれが生じやすい。

【0003】この点、面ファスナーを用いても大きい係合強度が得られ、かつ、着脱を繰り返しても係合強度の低下がないという利点がある。この場合の面ファスナーとしては、フック要素が多数の逆し字状やきこの状の突起となり、フック受け要素が基材部表面に両端が固定された多数の略半円弧状のループからなり、両要素が粘着力や化学的結合ではなく、からみ合いにより機械的に着脱（剥離）自在となっているものが一般に用いられている。そして、従来は、図11に拡大して示すように、ループ5a、5a…としては捲縮加工（高嵩加工）が施されたフィラメント糸（単フィラメントをfで図示）が用いられており、その高嵩性によってフック要素との強固な絡み合いが実現されている。また、このようにフロントテープに代えて面ファスナーを用いる場合においても、前記のターゲットを基材部5bに形成したものが市販されている。

【0004】

【発明が解決しようとする課題】しかし、従来の面ファスナーのフック受け要素では、主に「ループを構成する糸の高嵩さ」によって、図11に示すように、基材部表面の多数のループ5a、5a…によって基材部5b表面のターゲット（図示せず）が散点的に隠蔽されてしまい、ターゲットとしてキャラクターやデザイン模様等を施しても、それを鮮明に見ることができないという問題点があった。

【0005】したがって、本発明の課題は、面ファスナーテープを紙おむつの止着手段とするものにおいて、フック受け要素の基材部のターゲットを見易くすることにある。他の課題は、止着用フロントシート部分においても、通気性を有する製品を提供することにある。

【0006】

【課題を解決するための手段】本発明者らが鋭意研究したところによると、ループを有するフック受け要素における基材部ターゲットの見易さに影響するファクターとして、主に「ループを構成する糸の高嵩さ」、「ループの数密度（単位面積当たりのループの数）」、および「ループ配置の規則性」があることが判明した。以下、順に

説明する。

【0007】まず、「ループ構成する糸の高嵩さ」が、ターゲットの見易さに最も影響すると考えられる。従来のようにループを構成する糸が捲縮加工されたフィラメント糸（図11の拡大部参照）であると、隠蔽面積が過大になり、下のターゲットが見にくくなる。ループの太さはフィラメント糸であるため一義的に決め難いが、捲縮加工された従来品では、多数あるループの略全てが太さ約400 $\mu\text{m}$ 以上となっている。次に、「ループの数密度」については、概ね60個/ $\text{cm}^2$ を超える、特に50個/ $\text{cm}^2$ を超える、隠蔽作用が目視において目立つようになる。また、反対にループが疎ら過ぎて、そのみが目立つようになり、下のターゲットが見にくくなる傾向がある。したがって、数密度は10個/ $\text{cm}^2$ 、好適には30個/ $\text{cm}^2$ 、特に好適には40個/ $\text{cm}^2$ 以上とする。

【0008】さらに、「ループ配置の規則性」も重要である。多数あるループが図11に示すようにループ5a、5a…がランダムに配置されていると、実際の隠蔽割合以上に見えにくくなるのに対して、図10に示すようにループ5a、5a…が規則的に配置されていると隠蔽部分を想定し易く、実際の隠蔽割合よりも見易く感じられるのである。具体的には、基材部を平面的に見て、多数あるループの60%~70%以上、特に80~90%以上が所定の同一方向に膨出して見える形態をなしていると、ループによる実際の隠蔽割合よりも見易く感じられることが判明している。なおこの「ループ配置の規則性」には、「ループの長さ」が関係する、一つのループの長さが3mm、特に2mmを超える、それ自体による隠蔽作用が目視において目立つようになる。また、ループが長くなると、それ事態の隠蔽面積も大きくなり、また基材部への固定により生ずる拘束力がループ全体に作用しなくなるため、前述のように繊維がばらけてループがより太くなってしまった、自由部分が長くなるためにループが振じれる等により不規則な形に変形し、全体として不規則な配置となり、実際の隠蔽割合以上に見えにくくなったりする。

【0009】他方、実際の紙おむつにおけるフロントシートとしては、図10や図11に示すように、ターゲットが施された基材部5bと、この基材部5bの表面に固定された、多数のループ5a、5a…が膨出するように編成された格子網状体20とからなるフック受け要素が用いられている。このように、基材部5bに対するループ5a、5a…の接着力を格子網状部分によって補う形態では、格子網状体における「縦糸部分5c及び横糸部分5dの高嵩さ」や「縦糸部分間隔及び横糸部分間隔」も基材部5bのターゲットの見易さに影響する。後者の影響は、ループの数密度と同様である。

【0010】このように見てくると、上述のファクターの全てが相乗的に作用していることが判るが、やはり中

でもループの高さや数密度の影響が大きい。しかし、従来のフック受け要素におけるループの高さを単に少なくしたり、数密度を単に少なくしたりすると、フック要素との係合力が低下してしまい、本来の止着機能を損ないかねない。この問題点は、ループの数密度を上げることにより解決できるが、数密度を上げ過ぎると反対に基材部ターゲットの見易さを損ねてしまうという問題を解決できなくなる。

【0011】本発明は、これらの知見に基づいてなされたものであって、下記の構成を採用するものである。

＜請求項1記載の発明＞フック要素とこれと係脱自在の関係を有するフック受け要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された多数のループとからなり、各前記ループが、真直ぐなまたは緩やかにカーブしたフィラメント糸から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

＜作用効果＞請求項1記載の発明は、ループを構成する糸として、捲縮加工または好ましくは未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸を用いることによって、同じフィラメントの本数の糸を用いた場合でも著しく隠蔽面積が小さくなり、ターゲットがより見易くなる。これによりフィラメント糸の太さ及び本数を変えずに、従って強度を落とさずにターゲットをより見易くできる。

【0012】＜請求項2記載の発明＞前記ループの数密度が、 $10 \sim 60$  個/ $\text{cm}^2$  とされた、請求項1記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞かかるループ数密度範囲とすることによって、捲縮加工または好ましくは未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸を用いても十分な止着力が発揮される。また、ループの数密度がこの範囲にあると、一見すると密な配置によって隠蔽効果が大きくなると思われるが、実際に目視すると基材部自体の素材感に近く見えるため、ループが疎らに配置された従来品よりもかえって下のターゲットが見易くなる。

【0013】＜請求項3記載の発明＞フック要素とこれと係脱自在の関係を有するフック受け要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された、多数のループが膨出するように編成された格子網状体とからなり、前記ループを含む格子網状体が、真直ぐなまたは緩やかにカーブしたフィラメント

ト糸から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

＜作用効果＞請求項3記載の発明は、前述のように基材部に対するループの接着力を格子網状部分で補う例に関するものであり、かかる場合には基材部に存在する糸の全てを、捲縮加工または好ましくは未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸とすることにより、下の基材部のターゲットを見易くすることができ。

10 【0014】＜請求項4記載の発明＞前記ループの数密度が  $10 \sim 60$  個/ $\text{cm}^2$  とされるときに、前記格子網状体における縦糸部分間隔が  $1.5 \text{ mm}$  以下とされ、且つ横糸部分間隔が  $3.0 \text{ mm}$  以下とされた、請求項3記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞このように、ループの数密度を  $10 \sim 60$  個/ $\text{cm}^2$  とするとともに、縦糸部分間隔を  $1.5 \text{ mm}$  以下とし、且つ横糸部分間隔を  $3.0 \text{ mm}$  以下として、従来品よりもループおよび格子を密に形成することによって、請求項2記載の発明と同様に、かえって下のターゲットが見易くなり、また基材部に対する接着強度も高くなる利点ももたらされる。

【0015】＜請求項5記載の発明＞前記フック受け要素を平面的に見たときに、前記ループの60%以上が所定の同一方向に膨出して見える形態をなしている、請求項1～4のいずれか1項に記載の紙おむつ。

＜作用効果＞このようにループを規則的な配置にすることによって、前述のように実際の隠蔽割合以上に見え易くなる。

【0016】＜請求項6記載の発明＞前記フック受け要素単体の光透過率が60%以下とされた、請求項1～5のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞上記の本発明構成を適宜組み合わせ、光透過率を上記範囲とすることにより基材部のターゲットが見易いものとなる。

【0017】＜請求項7記載の発明＞前記ループを、ポリウレタン系接着剤により前記基材部に固定した、請求項1～6のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

40 ＜作用効果＞かかる接着剤を用いることにより、基材部表面の光沢感を抑えることができ、もって基材部のターゲットがより見易くなる。

【0018】＜請求項8記載の発明＞前記ターゲットが、胴回り方向に異なる複数の止着位置を表すデザインのものとして、請求項1～7のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞かかるデザインを施すことにより、止着時の締め付け度合いの目安が容易に判るようになる利点がある。

50 【0019】＜請求項9記載の発明＞前記基材部に対す

るターゲットが、グラビア印刷またはフレキシ印刷により形成された、請求項1～8のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

<作用効果>本発明のターゲットとしては、グラビア印刷またはフレキシ印刷を用いて形成することを推奨する。

【0020】<請求項10記載の発明>相互に止着された前記フック要素の表面と前記フック受け要素の表面とを、両表面に沿う方向に相対的にずらすのに要する力として定まる、せん断力が100g以上であり、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを、両表面に直交する方向に引き剥がすのに要する力として定まる、剥離力が10g以上である、請求項1～9のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

<作用効果>前述の構成により、ループによる止着力を十分に維持しながらもその下のターゲットを見易くすることができるが、具体的な止着力としては上記範囲のせん断力及び剥離力を有するように設計するのが望ましい。

【0021】ここに、本発明にいう「せん断強度試験方法」および「剥離強度試験方法」は次のように定義される。

(イ) せん断強度試験方法

① 図12に示すように、紙おむつ製品から40mm×100mmに切り取ったフック受け要素(フロントシート)5に、製品から切り取ったフック要素6のフックを有する部分全面を貼り付ける。このとき、フック要素6に対するフック受け要素5の向きが製品使用時と同様に、すなわちフック受け要素5の製品状態での縦方向と、フック要素6の製品状態での縦方向とが平行になるように貼り付ける。

② しかる後、フック要素6におけるフックを有しない基端部を引張試験機の上のチャックc1に、フック受け要素5における未係合部分を下のチャックに挟み、製品状態での横方向が縦方向に沿うような姿勢で、且つ上下チャックc1、c2間距離cyが50mmとなるように調整し、引張速度300mm/minでせん断方向に引っ張り、測定を行う。

③ 得られたチャートの最初のピークを読み取り、これをせん断強度とする。

【0022】(ロ) 剥離強度試験方法

① 図13に示すように、紙おむつ製品から40mm×100mmに切り取ったフック受け要素(フロントシート)5を、ループを有する側を表にして裏面を両面テープでステンレス板stに貼り付ける。固定されていない端部は表面がわからクラフトテープでステンレス板stに固定する。

② 次に、貼り付けたフック受け要素5の表面に、製品から切り取ったフック要素6のフックを有する部分全面

を貼り付ける。このとき、フック受け要素5に対するフック要素6の向きが製品使用時と同様に、すなわちフック受け要素5の製品状態での縦方向と、フック要素6の製品状態での縦方向とが平行になるように貼り付ける。しかる後、上記縦方向に質量2kgのローラーを1往復させ、フック要素5とフック受け要素6とを係合させる。

③ 次に、これらのステンレス板st、5、6をテーブルtbの縁等に固定し、フック要素6のフックを有しない基端部側7をテーブルのtb縁から折り曲げて吊り下げ、その吊り下げ部分にクラフトテープctの一端部を貼り、クラフトテープctの他端部に1kgの分銅Gを取り付け、2秒間荷重をかける。

④ 次いで、荷重を外し、フック要素を係合した状態のフック受け要素をステンレス板とともに図示しない引張試験機に持ち込み、剥離角度90°、引張速度300mm/minで測定を行う。この状態が図13(b)に示されている。

⑤ 得られたチャートから最大値と最小値を除き、残りのピークから最大ピーク、最小ピーク各3点(計6点)を読み取り、平均値を求め、これをせん断力とする。

【0023】<請求項11記載の発明>相互に止着された前記フック要素と前記フック受け要素とを剥離した時の音が15.0ゾーン以下である、請求項1～9のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

<作用効果>止着力を上げると、剥離時の音が過大となり耳障りになりがちであるので、剥離音が上記範囲に収まるように設計するのが望ましい。ここに、本発明にいう音の大きさ(ゾーン)は、剥離時の音を普通騒音計により測定し、この値(ホン)を下式(1)に代入して求める値である。

【数1】

$$S_{(N)} = 2^{\frac{P(N)-40}{10}} \dots (1)$$

【0024】<請求項12記載の発明>前記フック受け要素が、JIS-P-8117:ガーレー法による通気性が、9.0sec/100ml以上のものとされた、請求項1～11のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

<作用効果>通気性がかかる範囲にあると、フック受け要素を腹側に設けても十分な通気性が確保され、着用者に不快感を感じさせにくくなる。不透液性シートにも通気性を付与する場合において、止着用フロントシートの部分における通気性を損なうことがない。

【0025】<請求項13記載の発明>前記フック受け要素が、JIS-L-1099:MVTR法による透湿性が、500g/m<sup>2</sup>・d以上とされた、請求項1～12のいずれか1項に記載の止着用フロントシートを有す

る紙おむつ。

＜作用効果＞透湿性がかかる範囲にあると、フック受け要素を腹側に設けても十分な透湿性が確保され、着用者に不快感を感じにくくなる。不透液性シートにも透湿性を付与する場合において、止着用フロントシートの部分における透湿性を損なうことがない。

【0026】＜請求項14記載の発明＞前記ループを有するフック受け要素表面に対して起毛処理を施した、請求項1～12のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞かかる起毛処理を施すことにより、ループが引き出され、ばらけるのでフック要素との係合力が向上する。この場合、起毛処理を施さないものよりも若干ターゲットが見にくくなるものの、捲縮加工を施したフィラメント糸を用いる従来品よりは著しく見易く、また起毛処理によって止着力が向上するので、ループ密度を低下させることによって見易さを向上させ、起毛処理による見易さへの影響を相殺させることができる。

【0027】＜請求項15記載の発明＞各ループが、未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸から形成されている請求項1～14のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【0028】＜請求項16記載の発明＞フィラメント糸の材質がナイロンである請求項1～15のいずれか1項に記載の止着用フロントシートを有する紙おむつ。  
＜作用効果＞真直ぐなまたは緩やかにカーブしたフィラメント糸は未捲縮加工のものが、視認性に優れている。また、フィラメント糸の材質がナイロンであると、フック要素の止着性などの点で優れる。

【0029】

【発明の実施の形態】以下本発明を図面に示す実施の形態を参照しながらさらに詳説する。図1～図4は第1実施例を示したもので、紙おむつ本体は、表面（肌当たる面）側の不織布等からなる透液性トップシート1と、裏面のポリエチレンシート等からなる、より好ましくは内面側がポリエチレンシート等からなり、外面側が不織布からなるポリラミネーション不織布からなる不透液性バックシート2と、周周部分をフラップ部として残してそれらの間に介在された綿状パルプ等からなる吸収体3とを基本構成要素としている。ここで、ポリラミネーション不織布からなる不透液性バックシート2には、細かいニードル孔を多数形成することにより、これに通気性及び透湿性を付与したものを使用するの望ましい。

【0030】吸収体3に隣接して脚回り部分に1本または複数本の弾性伸縮部材4Aが必要により設けられている。前後端には、必要により前後漏れ防止用弾性伸縮部材4Bが設けられる。図示の形態は、吸収体3に隣接して脚回り部分に1本または複数本の弾性伸縮部材4Aを平面ギャザーとして設けたものであるが、より望ましくはバリヤーカフス（起立カフスとも呼ばれる）として設

けたものである。

【0031】この種の紙おむつ本体は公知のものであるが、本発明では腹部Sの外面に、多数のループ5aが基材5bに突出するフック受け要素を構成するフック受けシート（からみ受シート）5が、いわゆるフロントシートとして不透液性バックシート2により固定される。ただし、図1に示すフック受けシート5のループ5aは、図面を見易くするためにサイズや配置を決定しており、後述する本発明の範囲とは相関がない。

【0032】他方、背中Bが両側部には、面ファスナーの他の一つの要素が固定されている。実施例においては、背中Bが両側部はバックシート2とトップシート1により構成され、バックシート2の表面にその側縁から外方に張り出して主テープ部材6が、たとえば粘着剤層6Aにより固定され、トップシート1の表面とその側縁を跨いだ主テープ部材6の内面側との間に副テープ部材7が、たとえば両端が粘着剤層7Aにより固定状態で設けられている。前記主テープ部材6の副テープ部材7が存在しない内面側部分に、面ファスナーのフック要素を構成するフックシート8がたとえば粘着剤層8Aにより固定されている。フックシート8は、多数のフック片8aを基材8bに植設したものであり、フック片8aは前記ループ5aと係脱自在の関係にある。また、フックシート8は、好ましくは、主テープ部材6の先端から内側に設けることにより、先端部を握み部として残してある。

【0033】他方、図4に示されているように、未装着時には主テープ部材6を、製品の内側に折り畳んだ状態とされ、その際に、フックシート8は、副テープ部材7の一部、あるいは図5に示されるように、副テープ部材7全体を越える位置において不織布からなるトップシート1の繊維に刺離自在に絡んだ状態で係合している。より構成パーツを少なくするべく、図14に示すように、主テープ部材6のみを用い、その基端部およびバックシート2の側縁部と対応する部分のみを粘着剤層n1、n2を介してバックシート2に固定するとともに、主テープ部材6におけるフック片8a部分よりも先端側の中間部に粘着剤層n3を形成しておき、未装着時には主テープ部材6を、製品の内側に折り畳んだ状態で先端部の粘着剤層n3により製品内側に固定することでもできる。

【0034】かかる紙おむつにおいては、フックシート8を有する主テープ部材6、および副テープ部材7が紙おむつ本体に取付けられた後、図4に示すように、主テープ部材6を、紙おむつの内側に折り畳んだ状態とし、フックシート8を、副テープ部材7の一部を越える位置において、不織布からなるトップシート1の繊維に絡ませて係合しておき、製造工程をさらに進め、荷作り後、出荷する。紙おむつの装着時には、主テープ部材6の先端を握み、トップシート1からフックシート8を刺離



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し、その延在部分を腹側 S に持ち込み、フックシート 8 をフック受けシート 5 上に重ねる。この重ね合わせによって、各フック片 8 a が各ループ 5 a に絡み、紙おむつ前後の結合がなされる。排尿の有無の確認や装着のやり直しに際しては、フックシート 8 の延在部をフック受けシート 5 から剥して、再結合すればよい。

【0035】上記実施例においては、フックシート 8 を粘着剤 8 A に主テープ部材 6 に対して固定したが、粘着剤層 8 A によることなくフックシート 8 の基材 8 b を主テープ部材 6 に熱溶着などにより固定することもできる。フックシート 8 は、主テープ部材 6 の長手方向に沿って間隔を置いて複数設けることもできる。図 1 および図 2 に示されているように、フックシート 8 を有する主テープ部材 6 および副テープ部材 7 のファスナーテープは、紙おむつの一方の両側部に対して 2 つ設けたが、接合強度に応じて（あるいは幼児用などの用途に応じて）1 つまたは 3 以上とすることができる。また、図 6 に示すように、フック受けシート 5 は、腹側に個別に対応して配置してもよい。

【0036】前述のとおり、本発明においては、図 7 に断面で示すように多数のループ 5 a が基材部 5 b 表面に突出するフック受け要素を構成するフック受けシート 5 が不透液性バックシート 2 上に例えばホットメルト接着剤 11 により固定される。この場合、図示のように、基材部 5 b を構成する基材シートの表面に直接にターゲットをグラビア印刷やフレキソ印刷等の公知の印刷手段により施した後、その表面にホットメルト接着剤等によりループを固定するのが望ましい。基材シートの裏面にターゲットを付けることもでき、その場合には基材シート自体を透明または半透明な素材で形成する。この基材シート 5 b としては、印刷厚も含めて 2.5  $\mu\text{m}$  以下の厚さのものが好ましく、材質としては例えばポリエチレンが望ましい。

【0037】また、図 8 に断面で示すように、フック受けシート 5 を不透液性バックシート 2 に直接固定するのではなく、フック受けシート 5 を固定すべき位置において、前記フック要素 8 の止着位置のターゲット 9 が外面側に印刷された印刷フィルム 10 を、たとえばホットメルト接着剤 11 により不透液性バックシート 2 に固定し、その印刷フィルム 10 上にフック受けシート 5 を熱溶着により（熱溶着層を符号 12 で示す）積層一体化させるとともに、フック受けシート 5 は前記ターゲット 9 が外部から見えるようにするために、透明または半透明とすることもできる。この場合、印刷フィルム 10 も本発明の基材部を構成する。かくして、フック受けシート 5 を介して外部から前記ターゲット 9 が視認可能となっており、前記フック要素 8 の止着位置をターゲット 9 に応じて選択できる。ターゲット 9 としては、数字、マーク、色分け帯または線などによって表示でき、特にこれらによって、図 9 に示すように胴回り方向に異なる複数

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の止着位置を表すように色分けされた帯状のデザインからなるターゲット 9 を形成するのが望ましい。なお図 9 中では図面の見易さのため、色分けおよびループは省略している。しかし、本発明では次のようにフック受けシート 5 上には多数のループが設けられる。

【0039】そして特に本発明では、図 10 に平面を示すように、全てのループ 5 a、5 a... を未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系で形成する。従来品と同程度の太さのフィラメントからなるフィラメント系を用いた場合、ループの太さは一概にはいえないが略等が約 200  $\mu\text{m}$  以下になる。本発明では、かかる真直ぐなまたは緩やかにカーブしたフィラメント系を用いることにより、図 11 の従来品の対比図と比べると明らかにようにループ 5 a、5 a... による隠蔽面積が著しく小さくなり、基材部 5 b のターゲット 9 がループ 5 a、5 a... の存在にもかかわらず見易くなる。ただし、これだけであるところ、捲縮加工をしないことによってフックとの係合力が弱くなるので、ループ 5 a、5 a... の数密度を 10 ～ 60、好適には 30 ～ 60 個 /  $\text{cm}^2$ 、特に好適には 40 ～ 50 個 /  $\text{cm}^2$  以上にするのが望ましい。ループ 5 a、5 a... の数密度がかかる範囲にあると、前述のとおり下のターゲット 9 の見易さを損ねるところが、反対に見易くなる。

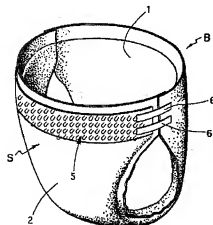
【0040】また図示のように、表面側から視認可能なターゲット 9 を有する基材部 5 b と、この基材部 5 b の表面に固定された、多数のループ 5 a が膨出するように編成された格子網状体 5 N とからなるフック受け要素を用いる場合には、格子網状体 5 N 全体（すなわち、縦系部分 5 c、横系部分 5 d、ループ 5 a の全て）を未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系により形成すると、下の基材部 5 b のターゲット 9 が見易くなる。この場合、ループ 5 a、5 a... の数密度を前述範囲となすとともに、格子網状体 20 における縦系部分間隔  $y$  を 1.5 mm 以下、特に 0.7 ～ 1.3 mm、且つ横系部分間隔  $x$  を 3.0 mm 以下、特に 1.5 ～ 1.8 mm とすることにより、前述のとおり下のターゲット 9 の見易さを損ねるところが、反対に見易くなる。この場合、格子網状体の目付けは、25.0 ～ 34.0  $\text{g}/\text{m}^2$  であるのが望ましい。

【0041】ここにフィラメント系は、拡大して示すようにの細いフィラメント  $f$  を 10 数本束ねたものであり、材質としては、ポリエチレンテレフタレート（PET）やナイロン等公知のもの全てを利用できるが、ナイロンが特に望ましい。フィラメント系の色としては、白色、半透明または透明のものが望ましい。さらに基材部 5 b のターゲット 9 を見易くするためには、フック受け要素を平面的に見たときに、ループ 5 a の 60 ～ 70 % 以上、特に 80 ～ 90 % 以上が図示のように所定の同一方向に膨出（図では縦系方向に対して左側に膨出）して見える形態をなすようにするのが好ましい。このため、

一つのループ5aの長さを3mm以下、特に2mm以下として、ループが不規則に変形しないようにするのが望ましい。また最終的な見易さの目安としては、フック受け要素単体の光透過率があり、本発明では、これが60%以下となるようにするのが好ましい。ループ5a、5aは、図示の場合は格子網状体とともに、基材部5bに例えばホットメルト接着剤により固定する。この際を用いるホットメルト接着剤としては、ゴム系、スチレン系、ポリウレタン系接着剤を用いることができるが、中でもポリウレタン系接着剤を用いると光沢感が減り、よりターゲットが見易くなる。かかる接着剤の塗布量としては、 $3.5\text{ g/m}^2$ 以上、特に $4.0\sim 5.0\text{ g/m}^2$ が好ましい。

【0042】他方、前述のように、ループ5a、5a…の数を増やすことによって、止着力（係合力）の低下を損なわないようにすることができるが、この止着力の最終的な目安としては、前述のせん断強度試験方法によるせん断力が100g以上で、前述の剥離強度試験方法による剥離力が10g以上であるように、前述の各ファクターを設定するのが望ましい。また、本発明においては、ループ5a、5a…を有するフック要素表面に対して起毛処理を施し、ループ5a、5aを若干引き出し、若干ばらばらさせることにより、フック要素との係合力を向上させることができる。この場合、止着力が向上するので、ループ密度を低下させることによって見易さを向上させ、起毛処理による見易さへの影響を相殺させることができる。その他の付加的な処理としては、本発明におけるフック受け要素に対して、例えば微細な透孔または窪み孔を散点的に多数設ける（図示せず）ことによって、JIS-P-8117：ガーレー法による通気性が $9.0\text{ sec}/100\text{ ml}$ 、またJIS-L-1099：MVT R法（塩化カルシウム法）による透湿性が、 $500\text{ g/m}^2 \cdot \text{d}$ 以上のものとするのも好ましい。 \*

【図1】



## \* 【0043】

【発明の効果】以上の通り、本発明によれば、面ファスナーテープを紙おむつの止着手段とするものにおいて、フック受け要素の基材部のターゲットが、ループによる隠蔽にもかかわらず見易くなる。

## 【図面の簡単な説明】

【図1】紙おむつの装着状態斜視図である。

【図2】製品の展開図である。

【図3】ファスナーテープを剥がした状態の要部横断面図である。

【図4】ファスナーテープを仮止めした状態の要部横断面図である。

【図5】他の例のファスナーテープを剥がした状態の要部横断面図である。

【図6】他の実施例の紙おむつの装着状態斜視図である。

【図7】フロントシートの断面図である。

【図8】フロントシートの断面図である。

【図9】他の実施例の紙おむつの装着状態斜視図である。

【図10】本発明に係るフロントシートの要部拡大平面図である。

【図11】従来のフロントシートの要部拡大平面図である。

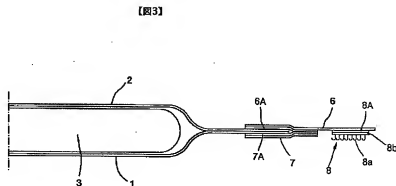
【図12】せん断強度試験方法の要領説明図である。

【図13】剥離強度試験方法の要領説明図である。

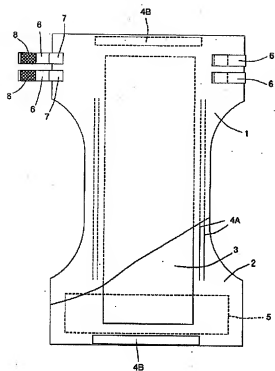
## 【符号の説明】

1…トップシート、2…バックシート、3…吸収体、5…フック受けシート、6…主テープ部材、7…副テープ部材、8…フックシート、9…ターゲット、10…印刷フィルム、11…ホットメルト接着剤、12…熱溶着層。

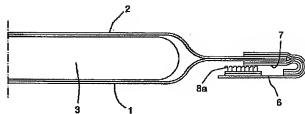
【図3】



【図2】

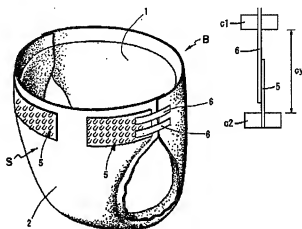


【図4】

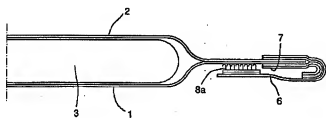


【図6】

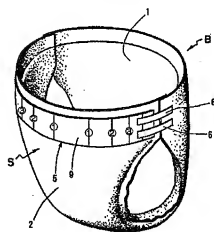
【図12】



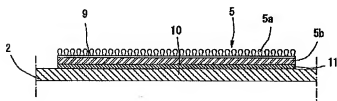
【図5】



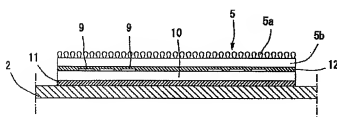
【図9】



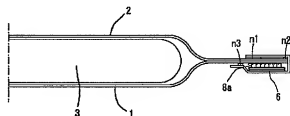
【図7】



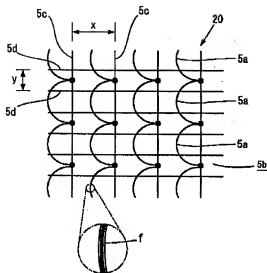
【図8】



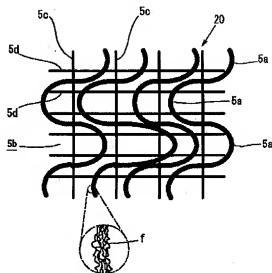
【図14】



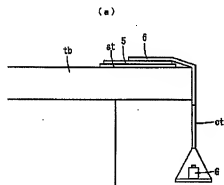
【図10】



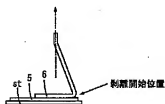
【図11】



【図13】



(b)



## 【手続補正書】

【提出日】平成13年4月20日（2001. 4. 20）

## 【手続補正4】

【補正対象書類名】明細書

【補正対象項目名】全文

【補正方法】変更

【補正内容】

## 【書類名】明細書

【発明の名称】止着用フロントシートを有する紙おむつ

【特許請求の範囲】

【請求項1】フック要素とこれと係脱自在の関係を有するフック受け要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用

者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された多数のループとからなり、各前記ループが、真直ぐなまたは緩やかにカーブしたフィラメント糸から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

【請求項2】前記ループの数密度が $10 \sim 60$ 個/cm<sup>2</sup>とされた、請求項1記載の止着用フロントシートを有する紙おむつ。

【請求項3】フック要素とこれと係脱自在の関係性を有するフック受け要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された、多数のループが露出するように編成された格子網状体とからなり、前記ループを含む格子網状体が、真直ぐなまたは緩やかにカーブしたフィラメント糸から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

【請求項4】前記ループの数密度が $10 \sim 60$ 個/cm<sup>2</sup>とされたとともに、前記格子網状体における縦糸部分間隔が $1.5$ mm以下とされ、且つ横糸部分間隔が $3.0$ mm以下とされた、請求項3記載の止着用フロントシートを有する紙おむつ。

【請求項5】前記フック受け要素を平面的に見たときに、前記ループの60%以上が所定の同一方向に露出して見える形態をなしている、請求項1～4のいずれか1項に記載の紙おむつ。

【請求項6】前記フック受け要素単体の光透過率が60%以下とされた、請求項1～5のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項7】前記ループを、ポリウレタン系接着剤により前記基材部に固定した、請求項1～6のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項8】前記ターゲットが、胴回り方向に異なる複数の止着位置を表すデザインのものでとされた、請求項1～7のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項9】前記基材部に対するターゲットが、グラフィック印刷またはフレキソ印刷により形成された、請求項1～8のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項10】せん断強度試験方法による、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを両表面に沿う方向に相対的にずらすのに要する力

として定まる、せん断力が $100$ g以上であり、剥離強度試験方法による、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを両表面に直交する方向に引き剥がすのに要する力として定まる、剥離力が $10$ g以上である、請求項1～9のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項11】相互に止着された前記フック要素と前記フック受け要素とを剥離した時の音が $15.0$ ソーン以下である、請求項1～10のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項12】前記フック受け要素が、JIS-P-8117:ガーレー法による通気性が、 $9.0$ sec/100ml以上のものとされた、請求項1～11のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項13】前記フック受け要素が、JIS-L-1099:MVT法による透湿性が、 $500$ g/m<sup>2</sup>・d以上のものとされた、請求項1～12のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項14】前記ループを有するフック受け要素表面に対して起毛処理を施した、請求項1～13のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項15】各ループが、未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸から形成されている請求項1～14のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【請求項16】フィラメント糸の材質がナイロンである請求項1～15のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、フック要素とフック受け要素との係合を行う着脱自在の面ファスナー（通常ベルクロファスナー（登録商標）またはマジックテープ（登録商標）と呼ばれる）を用いて装着するようにした紙おむつに関する。

【0002】

【従来の技術】一般に、紙おむつを被着用者に装着する場合のテープファスナーとしては、粘着剤を用いたものが主流をなしている。おむつカバーにおいては、前述の面ファスナーにて結合するようにしている。この面ファスナーを用いる場合、何回もの着脱が可能であり便利である。これに対して、粘着テープファスナーを紙おむつの両側部に固定し、紙おむつの腹側のバックシート表面に大きな面積をもつフロントシートを固定し、このフロントシートに対して粘着テープファスナーを止着し、取付位置を調整し直すことが可能な構造のものが汎用されている。この場合、粘着テープファスナーの止着位置の便宜のために、フロントテープの腹周り方向に間隔を置いてターゲット（目印）を印刷により形成したものが

知られている。フロントシートに対して粘着テープファスナーを着着するようにした構造のもの、テープファスナーの取付位置が調整可能である利点があるものの、着用後一旦剥がし、排尿の有無を確認した後、再度、フロントシートに固定する場合、粘着剤の止着強度が低下する。さらに、元来、粘着剤による接着強度に頼るために、たとえば大きい面積を有する成人用の紙おむつにおいては強度不足となり、剥がれが生じやすい。

【0003】この点、面ファスナーを用いると大きい係合強度が得られ、かつ、着脱を繰り返しても係合強度の低下がないという利点がある。この場合の面ファスナーとしては、フック要素が多数の逆し字状やきのこ状の突起からなり、フック受け要素が基材部表面に両端が固定された多数の略半円弧状のループからなり、両要素が粘着力や化学的結合ではなく、からみ合いにより機械的に着脱（剝離）自在となっているものが一般に用いられている。そして、従来は、図11に拡大して示すように、ループ5a、5a…として捲縮加工（嵩高加工）が施されたフィラメント糸（単フィラメントをfで図示）が用いられており、その嵩高性によってフック要素との強固な絡み合いが実現されている。また、このようにフロントテープに代えて面ファスナーを用いる場合においても、前記のターゲットを基材部5bに形成したものが市販されている。

【0004】

【発明が解決しようとする課題】しかし、従来の面ファスナーのフック受け要素では、主に「ループを構成する糸の嵩高さ」によって、図11に示すように、基材部表面の多数のループ5a、5a…によって基材部5b表面のターゲット（図示せず）が散点的に隠蔽されてしまい、ターゲットとしてキャラクターやデザイン模様等を施しても、それを鮮明に見ることができないという問題点があった。

【0005】したがって、本発明の課題は、面ファスナーテープを紙おむつの止着手段とするものにおいて、フック受け要素の基材部のターゲットを見易くすることにある。他の課題は、止着用フロントシート部分においても、通気性を有する製品を提供することにある。

【0006】

【課題を解決するための手段】本発明者らが鋭意研究したところによると、ループを有するフック受け要素における基材部ターゲットの見易さに影響するファクターとして、主に「ループを構成する糸の嵩高さ」、「ループの数密度（単位面積当たりのループの数）」、および「ループ配置の規則性」があることが判明した。以下、順に説明する。

【0007】先ず、「ループを構成する糸の嵩高さ」が、ターゲットの見易さに最も影響すると考えられる。従来のようにループを構成する糸が捲縮加工されたフィラメント糸（図11の拡大部参照）であると、隠蔽面積

が過大になり、下のターゲットが見にくくなる。ループの太さはフィラメント糸であるため一義的に決め難いが、捲縮加工された従来品では、多数あるループの略全長が太さ約400 $\mu$ m以上となっている。次に、「ループの数密度」については、概ね60個/ $\text{cm}^2$ を超えると、特に50個/ $\text{cm}^2$ を超えると、隠蔽作用が目視において目立つようになる。また、反対にループが疎ら過ぎても、そのみが目立つようになり、下のターゲットが見にくくなる傾向がある。したがって、数密度は10個/ $\text{cm}^2$ 、好適には30個/ $\text{cm}^2$ 、特に好適には40個/ $\text{cm}^2$ 以上とする。

【0008】さらに、「ループ配置の規則性」も重要である。多数あるループが図11に示すようにループ5a、5a…がランダムに配置されていると、実際の隠蔽割合以上に見えにくくなるのに対して、図10に示すようにループ5a、5a…が規則的に配置されていると隠蔽部分を想定し易く、実際の隠蔽割合よりも見易く感じられるのである。具体的に、基材部を平面的に見て、多数あるループの60%～70%以上、特に80～90%以上が所定の同一方向に膨出して見える形態をなしていること、ループによる実際の隠蔽割合よりも見易く感じられることが判明している。なおこの「ループ配置の規則性」には、「ループの長さ」が関係する、一つのループの長さが3mm、特に2mmを超えると、それ自体による隠蔽作用が目視において目立つようになる。また、ループが長くなると、それ自体の隠蔽面積も大きくなり、また基材部への固定により生ずる拘束力がループ全体に作用しなくなるため、前述のように繊維がばらけてループがより太く重なってしまったり、自由部分が長くなるためにループが損じられる等により不規則な形に變形し、全体として不規則な配置となり、実際の隠蔽割合以上に見えにくくなったりする。

【0009】他方、実際の紙おむつにおけるフロントシートとしては、図10や図11に示すように、ターゲットが施された基材部5bと、この基材部5bの表面に固定された、多数のループ5a、5a…が膨出するように編成された格子網状体20とからなるフック受け要素が用いられている。このように、基材部5bに対するループ5a、5a…の接着力を格子網状部分によって補う形態では、格子網状材における「縦糸部分5c及び横糸部分5dの嵩高さ」や「縦糸部分間隔及び横糸部分間隔」も基材部5bのターゲットの見易さに影響する。後者の影響は、ループの数密度と同様である。

【0010】このように見てくると、上述のファクターの全てが相乗的に作用していることが判るが、やはり中でもループの嵩高さや数密度の影響が大きい。しかし、従来のフック受け要素におけるループの嵩高さを単に少なくしたり、数密度を単に少なくしたりすると、フック要素との係合力が低下してしまい、本来の止着機能を損ないかねない。この問題点は、ループの数密度を上げる

ことにより解決できるが、数密度を上げ過ぎると反対に基材部ターゲットの見易さを損ねてしまうという問題を解決できなくなる。

【0011】本発明は、これらの知見に基づいてなされたものであって、下記の構成を採用するものである。

＜請求項1記載の発明＞フック要素とこれと係脱自在の関係を有するフック受け要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された多数のループとからなり、各前記ループが、真直ぐなまたは緩やかにカーブしたフィラメント系から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

＜作用効果＞請求項1記載の発明は、ループを構成する糸として、摺縮加工または好ましくは未摺縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系を用いることによって、同じフィラメントの本数の糸を用いた場合でも著しく隠蔽面積が小さくなり、ターゲットがより見易くなる。これによりフィラメント系の太さ及び本数を変えずに、従って強度を落とさずにターゲットをより見易くできる。

【0012】＜請求項2記載の発明＞前記ループの数密度が、 $10 \sim 60$ 個/ $\text{cm}^2$ とされた、請求項1記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞かかるループ数密度範囲とすることによって、摺縮加工または好ましくは未摺縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系を用いても十分な止着力が発揮される。また、ループの数密度がこの範囲にあると、一見すると密な配置によって隠蔽効果が大きくなると思われるが、実際に目視すると基材部自体の素材感に近く見えるため、ループが疎らに配置された従来品よりもかえって下のターゲットが見易くなる。

【0013】＜請求項3記載の発明＞フック要素とこれと係脱自在の関係を有するフック受け要素との組み合わせによる面ファスナーを用い、紙おむつ背側の両側部に前記面ファスナーのフック要素を固定し、フック受け要素を腹側に固定し、着用者への装着時の固定手段とする紙おむつにおいて、前記フック受け要素は、表面側から視認可能なターゲットを有する基材部と、この基材部の表面に固定された、多数のループが露出するように編成された格子網状体とからなり、前記ループを含む格子網状体が、真直ぐなまたは緩やかにカーブしたフィラメント系から形成された、ことを特徴とする止着用フロントシートを有する紙おむつ。

＜作用効果＞請求項3記載の発明は、前述のように基材部に対するループの接着力を格子網状部分で補う例に関するものであり、かかる場合には基材部上に存在する糸

の全てを、摺縮加工または好ましくは未摺縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系とすることにより、下の基材部のターゲットを見易くすることができる。

【0014】＜請求項4記載の発明＞前記ループの数密度が $10 \sim 60$ 個/ $\text{cm}^2$ とされるときにも、前記格子網状体における縦糸部分間隔が $1.5 \text{ mm}$ 以下とされ、且つ横糸部分間隔が $3.0 \text{ mm}$ 以下とされた、請求項3記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞このように、ループの数密度を $10 \sim 60$ 個/ $\text{cm}^2$ とするとともに、縦糸部分間隔を $1.5 \text{ mm}$ 以下とし、且つ横糸部分間隔を $3.0 \text{ mm}$ 以下として、従来品よりもループおよび格子を密に形成することによって、請求項2記載の発明と同様に、かえって下のターゲットが見易くなり、また基材部に対する接着強度も高くなる利点ももたらされる。

【0015】＜請求項5記載の発明＞前記フック受け要素を平面的に見たときに、前記ループの $60\%$ 以上が所定の同一方向に露出している見易さを有している、請求項1～4のいずれか1項に記載の紙おむつ。

＜作用効果＞このようにループを規則的な配置にすることによって、前述のように実際の隠蔽割合以上に見易くなる。

【0016】＜請求項6記載の発明＞前記フック受け要素単体の光透過率が $60\%$ 以下とされた、請求項1～5のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞上記の本発明構成を適宜組み合わせ、光透過率を上記範囲とすることにより基材部のターゲットが見易いものとなる。

【0017】＜請求項7記載の発明＞前記ループを、ポリウレタン系接着剤により前記基材部に固定した、請求項1～6のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞かかる接着剤を用いることにより、基材部表面の光沢感を抑えることができ、もって基材部のターゲットがより見易くなる。

【0018】＜請求項8記載の発明＞前記ターゲットが、胴回り方向に異なる複数の止着位置を表すデザインのものであった、請求項1～7のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞かかるデザインを施すことにより、止着時の締め付け度合いの目安が容易に判るようになる利点がある。

【0019】＜請求項9記載の発明＞前記基材部に対するターゲットが、グラビア印刷またはフレキソ印刷により形成された、請求項1～8のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞本発明のターゲットとしては、グラビア印刷またはフレキソ印刷を用いて形成することを推奨す

る。

【0020】＜請求項10記載の発明＞せん断強度試験方法による、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを、両表面に沿う方向に相対的にずらすのに要する力として定まる、せん断力が100g以上であり、剥離強度試験方法による、相互に止着された前記フック要素の表面と前記フック受け要素の表面とを、両表面に直交する方向に引き剥がすのに要する力として定まる、剥離力が10g以上である、請求項1～9のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞前述の構成により、ループによる止着力を十分に維持しながらもその下のターゲットを見易くすることができる、具体的な止着力としては上記範囲のせん断力及び剥離力を有するように設計するのが望ましい。

【0021】ここに、本発明にいう「せん断強度試験方法」および「剥離強度試験方法」は次のように定義される。

（イ）せん断強度試験方法

① 図12に示すように、紙おむつ製品から40mm×100mmに切り取ったフック受け要素（フロントシート）5に、製品から切り取ったフック要素8のフックを有する部分全面を貼り付ける。このとき、フック要素8に対するフック受け要素5の向きが製品使用時と同様に、すなわちフック受け要素5の製品状態での縦方向と、フック要素8の製品状態での縦方向とが平行になるように貼り付ける。

② しかる後、フック要素8におけるフックを有しない基端部を引張試験機の上のチャックc1に、フック受け要素5における未係合部分を下のチャックに挟み、製品状態での横方向が縦方向に沿うような姿勢で、且つ上下チャックc1、c2間距離cyが50mmとなるように調整し、引張速度300mm/minでせん断方向に引っ張り、測定を行う。

③ 得られたチャートの最初のピークを読み取り、これをせん断強度とする。

【0022】（ロ）剥離強度試験方法

① 図13に示すように、紙おむつ製品から40mm×100mmに切り取ったフック受け要素（フロントシート）5を、ループを有する側を表にして裏面を両面テープでステンレス板stに貼り付ける。固定されない端部は表面がわからクラフトテープでステンレス板stに固定する。

② 次に、貼り付けたフック受け要素5の表面に、製品から切り取ったフック要素8のフックを有する部分全面を貼り付ける。このとき、フック受け要素5に対するフック要素8の向きが製品使用時と同様に、すなわちフック受け要素5の製品状態での縦方向と、フック要素8の製品状態での縦方向とが平行になるように貼り付ける。

しかる後、上記縦方向に質量2kgのローラーを1往復させ、フック要素8とフック受け要素5とを係合させる。

③ 次に、これらのステンレス板st、5、6をテーパーltbの縁等に固定し、フック要素8のフックを有しない基端部側をテーパーのltb縁から折り曲げて吊り下げ、その吊り下げ部分にクラフトテープc1の一端部を貼り、クラフトテープc1の他端部に1kgの分銅Gを取り付け、2秒間荷重をかける。

④ 次いで、荷重を外し、フック要素を係合した状態のフック受け要素をステンレス板とともに図示しない引張試験機に持ち込み、剥離角度90°、引張速度300mm/minで測定を行う。この状態が図13（b）に示されている。

⑤ 得られたチャートから最大値と最小値を除き、残りのピークから最大ピーク、最小ピーク各3点（計6点）を読み取り、平均値を求め、これをせん断力とする。

【0023】＜請求項11記載の発明＞相互に止着された前記フック要素と前記フック受け要素とを剥離した時の音が15.0ゾーン以下である、請求項1～10のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞止着力を上げると、剥離時の音が過大となり耳障りになりがちであるので、剥離音が上記範囲に収まるように設計するのが望ましい。ここに、本発明にいう音の大きさ（ゾーン）は、剥離時の音を普通騒音計により測定し、この値（ホン）を下式（1）に代入して求まる値である。

【数1】

$$S_{(N)} = 2^{\frac{P(N)-40}{10}} \dots (1)$$

【0024】＜請求項12記載の発明＞前記フック受け要素が、JIS-P-8117：ガーレー法による通気性が、9.0sec/100ml以上のものとされた、請求項1～11のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞通気性がかかる範囲にあると、フック受け要素を腹側に設けても十分な通気性が確保され、着用者に不快感を感じさせにくくなる。不透液性シートにも通気性を付与する場合において、止着用フロントシートの部分における通気性を損なうことがない。

【0025】＜請求項13記載の発明＞前記フック受け要素が、JIS-L-1099：MVTR法による透湿性が、500g・m<sup>2</sup>・d以上とされた、請求項1～12のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

＜作用効果＞透湿性がかかる範囲にあると、フック受け要素を腹側に設けても十分な透湿性が確保され、着用者



に不快感を感じさせにくくなる。不透液性シートにも透湿性を付与する場合において、止着用フロントシートの部分における透湿性を損なうことがない。

【0026】<請求項14記載の発明>前記ループを有するフック受け要素表面に対して起毛処理を施した、請求項1〜13のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

<作用効果>かかる起毛処理を施すことにより、ループが引き出され、ばらけるのでフック要素との係合力が向上する。この場合、起毛処理を施さないものよりも若干ターゲットが見にくくなるものの、捲縮加工を施したフィラメント糸を用いる従来品よりは著しく見易く、また起毛処理によって止着力が向上するので、ループ密度を低下させることによって見易さを向上させ、起毛処理による見易さへの影響を相殺させることができる。

【0027】<請求項15記載の発明>各ループが、未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント糸から形成されている請求項1〜14のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

【0028】<請求項16記載の発明>フィラメント糸の材質がナイロンである請求項1〜15のいずれか1項に記載の止着用フロントシートを有する紙おむつ。

<作用効果>真直ぐなまたは緩やかにカーブしたフィラメント糸は未捲縮加工のものが、視認性に優れている。また、フィラメント糸の材質がナイロンであると、フック要素の止着性などの点で優れる。

【0029】

【発明の実施の形態】以下本発明を図面に示す実施の形態を参照しながらさらに詳説する。図1〜図4は第1実施例を示したもので、紙おむつ本体は、表面（肌当たる面）側の不織布等からなる透液性トップシート1と、裏面のポリエチレンシート等からなる、より好ましくは内面側がポリエチレンシート等からなり、外面側が不織布からなるポリラミ不織布からなる不透液性バックシート2と、周囲部分をフラップ部として残してそれらの間に介在された綿状パルプ等からなる吸収体3とを基本構成要素としている。ここで、ポリラミ不織布からなる不透液性バックシート2には、細かいニードル孔を多数形成することにより、これに通気性及び透湿性を付与したものを使用するの望ましい。

【0030】吸収体3に隣接して脚回り部分に1本または複数本の弾性伸縮部材4Aが必要により設けられている。前後端には、必要により前後漏れ防止用弾性伸縮部材4Bが設けられる。図示の形態は、吸収体3に隣接して脚回り部分に1本または複数本の弾性伸縮部材4Aを平面ギャザーとして設けたものであるが、より望ましくはバリヤーカフス（起立カフスとも呼ばれる）として設けたものである。

【0031】この種の紙おむつ本体は公知のものであるが、本発明では腹部Bの外面に、多数のループ5aが基

材5bに突出するフック受け要素を構成するフック受けシート（からみ受シート）5が、いわゆるフロントシートとして不透液性バックシート2により固定されている。ただし、図1に示すフック受けシート5のループ5aは、図面を見易くするためにサイズや配置を決定しており、後述する本発明の範囲とは相関がない。

【0032】他方、背中Bが両側部には、面ファスナーの他の一つの要素が固定されている。実施例においては、背中Bが両側部はバックシート2とトップシート1とにより構成され、バックシート2の表面にその側縁から外方に張り出して主テープ部材6が、たとえば粘着剤層6Aにより固定され、トップシート1の表面とその側縁を跨いだ主テープ部材6の内面側との間に副テープ部材7が、たとえば両端が粘着剤層7Aにより固定状態で設けられている。前記主テープ部材6の副テープ部材7が存在しない内面側部分に、面ファスナーのフック要素を構成するフックシート8がたとえば粘着剤層8Aにより固定されている。フックシート8は、多数のフック片8aを基材8bに極設したものであり、フック片8aは前記ループ5aと係脱自在の関係にある。また、フックシート8は、好ましくは、主テープ部材6の先端から内側に設けることにより、先端部を握み部として残してある。

【0033】他方、図4に示されているように、未装着時においては主テープ部材6を、製品の内部に折り畳んだ状態とされ、その際に、フックシート8は、副テープ部材7の一部、あるいは図5に示されるように、副テープ部材7全体を越える位置において不織布からなるトップシート1の繊維に刺離自在に絡んだ状態で係合している。より構成パーツを少なくするべく、図14に示すように、主テープ部材6のみを用い、その基端部およびバックシート2の側縁部と対応する部分のみを粘着剤層n1、n2を介してバックシート2に固定するとともに、主テープ部材6におけるフック片8A部分よりも先端側の中間部に粘着剤層n3を形成しておき、未装着時においては主テープ部材6を、製品の内部に折り畳んだ状態で先端部の粘着剤層n3により製品内部に固定することもある。

【0034】かかる紙おむつにおいては、フックシート8を有する主テープ部材6、および副テープ部材7が紙おむつ本体に取付けられた後、図4に示すように、主テープ部材6を、紙おむつの内側に折り畳んだ状態とし、フックシート8を、副テープ部材7の一端を越える位置において、不織布からなるトップシート1の繊維に絡ませて係合しておき、製造工程をさらに進め、荷役り出、出荷する。紙おむつの装着時には、主テープ部材6の先端を握み、トップシート1からフックシート8を剥離し、その延在部分を腹側Sに持ち込み、フックシート8をフック受けシート5上に重ねる。この重ね合わせによって、各フック片8aが各ループ5aに絡み、紙おむつ

前後の結合がなされる。排尿の有無の確認や装着のやり直しに際しては、フックシート8の延在部をフック受けシート5から剥して、再結合すればよい。

【0035】上記実施例においては、フックシート8を粘着剤8Aにて主テープ部材6に対して固定したが、粘着剤層8Aによることなくフックシート8の基材8bを主テープ部材6に熱溶着などにより固定することもできる。フックシート8は、主テープ部材6の長手方向に沿って間隔を置いて複数設けることもできる。図1および図2に示されているように、フックシート8を有する主テープ部材6および副テープ部材7のファスナーテープは、紙おむつの一方の両側部に対して2つ設けたが、接合強度に応じて（あるいは幼児用などの用途に応じて）1つまたは3以上とすることができる。また、図6に示すように、フック受けシート5は、腹側に個別に対応して配置してもよい。

【0036】前述のとおり、本発明においては、図7に断面で示すように多数のループ5aが基材部5b表面に突出するフック受け要素を構成するフック受けシート5が不透液性バックシート2上に例えばホットメルト接着剤11により固定される。この場合、図示のように、基材部5bを構成する基材シートの表面に直接にターゲットをグラビア印刷やフレキソ印刷等の公知の印刷手段により施した後、その表面にホットメルト接着等によりループを固定するのが望ましい。基材シートの裏面にターゲットを付けることもでき、その場合には基材シート自体を透明または半透明な素材で形成する。この基材シート5bとしては、印刷厚も含めて25 $\mu$ m以下の厚さのものが好ましく、材質としては例えばポリエチレンが望ましい。

【0037】また、図8に断面で示すように、フック受けシート5を不透液性バックシート2に直接固定するのではなく、フック受けシート5を固定すべき位置において、前記フックシート8の止着位置のターゲット9が外面側に印刷された印刷フィルム10を、たとえばホットメルト接着剤11により不透液性バックシート2に固定し、その印刷フィルム10上にフック受けシート5を熱溶着により（熱溶着層を符号12で示す）積層一体化させるとともに、フック受けシート5は前記ターゲット9が外面側から見えるようにするために、透明または半透明とすることもできる。この場合、印刷フィルム10も本発明の基材部を構成する。かくして、フック受けシート5を介して外部から前記ターゲット9が視認可能となっており、前記フックシート8の止着位置をターゲット9に応じて選択できる。ターゲット9としては、数字、マーク、色分け帯または線などによって表示でき、特にこれらによって、図9に示すように胴回り方向に異なる複数の止着位置を表すように色分けされた帯状のデザインからなるターゲット9を形成するのが望ましい。なお図9中では図面の見易さのため、色分けおよびループは省

略している。しかし、本発明では次述のようにフック受けシート5上には多数のループが設けられる。

【0038】そして特に本発明では、図10に平面を示すように、全てのループ5a、5a…を未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系で形成する。従来品と同程度の太さのフィラメントからなるフィラメント系を用いた場合、ループの太さは一概にはいえないが略全てが約200 $\mu$ m以下になる。本発明では、かかる真直ぐなまたは緩やかにカーブしたフィラメント系を用いることにより、図11の従来品の対比図と比べると明らかにループ5a、5a…による隠蔽面積が著しく小さくなり、基材部5bのターゲット9がループ5a、5a…の存在にもかかわらず見易くなる。ただし、これだけであるところ、捲縮加工をしていないことによってフレックとの係合力が弱くなるので、ループ5a、5a…の数密度を10～60、好適には30～60個/cm<sup>2</sup>、特に好適には40～50個/cm<sup>2</sup>以上にするのが望ましい。ループ5a、5a…の数密度がかかる範囲にあると、前述のとおり下のターゲット9の見易さを損ねるところか、反対に見易くなる。

【0039】また図示のように、表面側から視認可能なターゲット9を有する基材部5bと、この基材部5bの表面に固定された、多数のループ5aが露出するように編成された格子網状体とからなるフック受け要素を用いる場合には、格子網状体全体（すなわち、縦糸部分5c、横糸部分5d、ループ5aの全て）を未捲縮加工の真直ぐなまたは緩やかにカーブしたフィラメント系により形成すると、下の基材部5bのターゲット9が見易くなる。この場合、ループ5a、5a…の数密度を前述範囲となすとともに、格子網状体20における縦糸部分間隔yを1.5mm以下、特に0.7～1.3mm、且つ横糸部分間隔xを3.0mm以下、特に1.5～1.8mmとなすことにより、前述のとおり下のターゲット9の見易さを損ねるところか、反対に見易くなる。この場合、格子網状体の目付けは、25.0～34.0g/m<sup>2</sup>であるのが望ましい。

【0040】ここにフィラメント系は、拡大して示すように細いフィラメントfを10数本束ねたものであり、材質としては、ポリエチレンテレフタレート（PET）やナイロン等公知のもの全てを利用できるが、ナイロンが特に望ましい。フィラメント系の色としては、白色、半透明または透明のものが望ましい。さらに基材部5bのターゲット9を見易くするためには、フック受け要素を平面的に見たときに、ループ5aの60～70%以上、特に80～90%以上が図示のように所定の同一方向に膨出（図では縦糸方向に対して左側に膨出）して見える形態をなすようにするのが好ましい。このため、一つのループ5aの長さを3mm以下、特に2mm以下として、ループが不規則に変形しないようにするのが望ましい。また最終的な見易さの目安としては、フック受け

要素単体の光透過率があり、本発明では、これが60%以下となるようにするのが好ましい。ループ5a、5aは、図示の場合は格子網状とともに、基材部5bに例えばホットメルト接着剤により固定する。この際に用いるホットメルト接着剤としては、ゴム系、スチレン系、ポリウレタン系接着剤を用いることができるが、中でもポリウレタン系接着剤を用いると光沢感が減り、よりターゲットが見易くなる。かかる接着剤の塗布量としては、 $3.5 \text{ g/m}^2$ 以上、特に $4.0 \sim 5.0 \text{ g/m}^2$ が好ましい。

【0041】他方、前述のように、ループ5a、5a…の数密度を増すことによって、止着力（係合力）の低下を損なわないようにすることができるが、この止着力の最終的な目安としては、前述のせん断強度試験方法によるせん断力が100g以上で、前述の剝離強度試験方法による剝離力が10g以上であるように、前述の各ファクターを設定するのが望ましい。また、本発明においては、ループ5a、5a…を有するフック要素表面に対して起毛処理を施し、ループ5a、5aを若干引き出し、若干ばらけさせることにより、フック要素との係合力を向上させることができる。この場合、止着力が向上するので、ループ密度を低下させることによって見易さを向上させ、起毛処理による見易さへの影響を相殺させることができる。その他の付加的な処理としては、本発明におけるフック受け要素に対して、例えば微細な透孔または窪み孔を散点的に多数設ける（図示せず）ことによって、JIS-P-8117：ガーレー法による通気性が $9.0 \text{ sec}/100 \text{ ml}$ 、またJIS-L-1099：MVT法（塩化カルシウム法）による透湿性が $500 \text{ g/m}^2 \cdot \text{d}$ 以上のものとするのも好ましい。

#### 【0042】

【発明の効果】以上の通り、本発明によれば、面ファスナーテープを紙おむつの止着手段とするものにおいて、フック受け要素の基材部のターゲットが、ループによる隠蔽にもかかわらず見易くなる。

#### 【図面の簡単な説明】

【図1】紙おむつの装着状態斜視図である。

【図2】製品の展開図である。

【図3】ファスナーテープを剥がした状態の要部横断面図である。

【図4】ファスナーテープを仮止めした状態の要部横断面図である。

【図5】他の例のファスナーテープを剥がした状態の要部横断面図である。

【図6】他の実施例の紙おむつの装着状態斜視図である。

【図7】フロントシートの断面図である。

【図8】フロントシートの断面図である。

【図9】他の実施例の紙おむつの装着状態斜視図である。

【図10】本発明に係るフロントシートの要部拡大平面図である。

【図11】従来のフロントシートの要部拡大平面図である。

【図12】せん断強度試験方法の要領説明図である。

【図13】剝離強度試験方法の要領説明図である。

【図14】ファスナーテープを仮止めした状態の要部横断面図である。

#### 【符号の説明】

1…トップシート、2…バックシート、3…吸収体、5…フック受けシート、6…主テープ部材、7…副テープ部材、8…フックシート、9…ターゲット、10…印刷フィルム、11…ホットメルト接着剤、12…熱溶着層。

#### 【手続補正5】

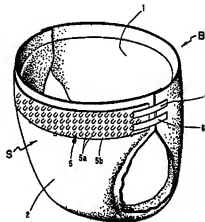
【補正対象書類名】図面

【補正対象項目名】図1

【補正方法】変更

【補正内容】

【図1】



#### 【手続補正6】

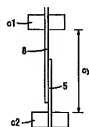
【補正対象書類名】図面

【補正対象項目名】図12

【補正方法】変更

【補正内容】

【図12】

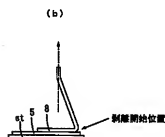
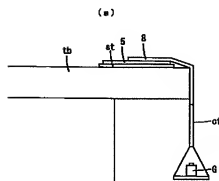


#### 【手続補正7】

【補正対象書類名】図面  
 【補正対象項目名】図1 3  
 【補正方法】変更

\* 【補正内容】  
 【図1 3】

\*



フロントページの続き

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 3B100 DA02 DA07 DB02

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## CLAIMS

## [Claim(s)]

[Claim 1] The surface fastener by the combination of a hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element it consists of the base material section which has the target which can be checked by looking from a front-face side, and a loop formation of a large number fixed to the front face of this base material section, and each aforementioned loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

[Claim 2] The disposable diaper which has the front seat for firm attachment according to claim 1 with which 10-60 number density /of said loop formation was set to 2 cm.

[Claim 3] The surface fastener by the combination of a hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element Were fixed to the front face of the base material section which has the target which can be checked by looking from a front-face side, and this base material section. the grid reticulum which consists of a grid reticulum composed so that many loop formations might bulge, and includes said loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

[Claim 4] The disposable diaper which has the front seat for firm attachment according to claim 3 with which warp partial spacing in said grid reticulum was set to 1.5mm or less, and weft partial spacing was set to 3.0mm or less while 10-60 number density /of said loop formation was set to 2 cm.

[Claim 5] A disposable diaper given in any 1 term of claims 1-4 which is making the gestalt which bulge and is in sight in the same direction of said loop formation predetermined 60% or more when said hook receptacle element is seen superficially.

[Claim 6] The disposable diaper with which light transmittance of said hook receptacle element simple substance was made into 60% or less and which has the front seat for firm attachment of a publication in any 1 term of claims 1-5.

[Claim 7] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-6 which fixed said loop formation to said base material section with polyurethane adhesive.

[Claim 8] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-7 made into the thing of the design to which said target expresses two or more different firm attachment locations in the direction of a periphery.

[Claim 9] The disposable diaper with which the target to said base material section has the front seat for firm attachment of a publication in any 1 term of claims 1-8 formed of gravure or flexographic printing.

[Claim 10] Become settled as force of taking the front face of said hook element attached firmly to mutual [ by the shear strength test method ], and the front face of said hook receptacle element to shift relatively [ direction / along both front faces ]. Become settled as force taken to tear off the front face of said hook element which shearing force is 100g or more, and was attached firmly to mutual [ by the peel strength test method ], and the front face of said hook receptacle element in the direction which intersects perpendicularly with both front faces. The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose exfoliation force is 10g or more.

[Claim 11] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-10 whose sound when exfoliating said hook element attached firmly mutually and said hook receptacle element is 15.0 sones or less.

[Claim 12] The disposable diaper with which the permeability according [ said hook receptacle element ] to the JIS-P-8117:gar rhe method has the front seat for firm attachment of a publication in any 1 term of claims 1-11 made into 9.0sec / thing 100ml or more.

[Claim 13] The disposable diaper with which the moisture permeability according [ said hook receptacle element ] to the JIS-L-1099:MVTR method has the front seat for firm attachment of a publication in any 1 term of claims 1-12 made into the thing 500 g/m<sup>2</sup> and more than d.

[Claim 14] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-12 which performed piloerection processing to the hook receptacle element front face which has said loop formation.

[Claim 15] each loop formation of non-crimp processing is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-14 currently formed from the filament yarn curved gently.

[Claim 16] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-15 whose quality of the materials of filament yarn are nylon.

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[Translation done.]

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the disposable diaper with which it equipped using the surface fastener (usually called the Velcro fastener (trademark) or a piece of Velcro (trademark)) which can be detached and attached, and which performs engagement to a hook element and a hook carrier element.

[0002]

[Description of the Prior Art] Generally, the thing using the binder as a tape fastener in the case of equipping the person for covering with a disposable diaper is making the mainstream. He is trying to join together with the above-mentioned surface fastener in a diaper cover. When using this surface fastener, many times attachment and detachment are possible, and it is convenient. On the other hand, an adhesive tape fastener is fixed to the both-sides section of a disposable diaper, a front seat is fixed to the backseat front face of the venter of a disposable diaper with a large area, an adhesive tape fastener is attached firmly to this front seat, and the thing of the structure which can readjust an attaching position is used widely. In this case, what kept spacing in the direction of the circumference of an antinode of a front tape, and formed the target (mark) by printing for the facilities of the firm attachment location of an adhesive tape fastener is known. Although the thing of the structure which attached the adhesive tape fastener firmly to the front seat has the advantage which can adjust the attaching position of a tape fastener, after once removing after wear and checking the existence of urination, when it fixes to a front seat, the firm attachment reinforcement of a binder falls again. Furthermore, originally, in order to depend on the bond strength by the binder, in the disposable diaper for the adult who has a large area, it becomes insufficient [ reinforcement ], and is easy to produce peeling.

[0003] If this point and a surface fastener are used, even if large engagement reinforcement will be obtained and it will repeat attachment and detachment, there is an advantage that there is no fall of engagement reinforcement. As a surface fastener in this case, a hook element consists of a projection of the shape of much reverse RE character, or fungoid, a hook receptacle element consists of a loop formation of an abbreviation semicircle arc of a large number by which both ends were fixed to the base material section front face, and, generally what both elements can detach and attach freely mechanically not by adhesion or chemical association but by tangle (exfoliation) is used. And the filament yarn (a single filament is illustrated by f) with which crimp processing (bulky processing) was performed as loop-formation 5a and 5a-- is used, and a firm tangle to a hook element is realized by the loft so that it may expand to drawing 11 and may be shown conventionally. Moreover, when replacing with a front tape in this way and using a surface fastener, what formed the aforementioned target in base material section 5b is marketed.

[0004]

[Problem(s) to be Solved by the Invention] However, with the hook receptacle element of the conventional surface fastener, as "dimension height of the yarn which constitutes a loop formation" showed to drawing 11, even if the target (not shown) of a base material section 5b front face will be

concealed by much loop-formation 5a of a base material section front face, and 5a-- in dispersion and it mainly gave the character, a design pattern, etc. as a target by them, there was a trouble that it could not be seen vividly.

[0005] Therefore, the technical problem of this invention is one of those which make a field zipper tape the firm attachment means of a disposable diaper, and is to make legible the target of the base material section of a hook receptacle element. Other technical problems are also in the front seat part for firm attachment to offer the product which has permeability.

[0006]

[Means for Solving the Problem] According to the place which this invention persons studied wholeheartedly, it became clear that there were mainly "dimension height of the yarn which constitutes a loop formation", "the number density (the number of the loop formations per unit area) of a loop formation", and "regularity of loop-formation arrangement" as a factor which influences the conspicuousness of the base material section target in the hook receptacle element which has a loop formation. Hereafter, it explains in order of.

[0007] First, "dimension height of the yarn which carries out loop arrangement" is considered to influence the conspicuousness of a target most. Concealment area becomes it excessive that the yarn which constitutes a loop formation like before is filament yarn (refer to the limb of drawing 11) by which crimp processing was carried out, and a lower target becomes hard to see. Although it is hard to decide uniquely since the size of a loop formation is filament yarn, all the abbreviation for the loop formation [ a large number in elegance ] by which crimp processing was carried out serves as about 400 micrometers or more of sizes conventionally. Next, if it exceeds 60 2 [ / ] cm in general, when it will exceed 50 2 [ / ] cm especially, a concealment operation comes to be conspicuous about "number density of a loop formation", in viewing. Moreover, even if a loop formation is too sparse on the contrary, only it comes to be conspicuous and there is an inclination for a lower target to become hard to see. therefore, number density -- 10 piece/cm<sup>2</sup> -- suitable -- 30 piece/cm<sup>2</sup> -- it carries out to two or more [ 40 //cm ] suitably especially.

[0008] Furthermore, "the regularity of loop-formation arrangement" is important. If loop-formation 5a and 5a-- is regularly arranged as it is shown in drawing 10 to being hard coming to be visible more than an actual concealment rate, when loop-formation 5a and 5a-- is arranged at random, as an a large number loop formation shows drawing 11, it will be easy to assume a concealment part and will sense more legible than an actual concealment rate. The base material section was seen superficially, and if 80 - 90% or more is making especially the gestalt which bulge and is in sight in the same predetermined direction 60% to 70% or more of the a large number loop formation, specifically, it will have become clear that it senses more legible than the actual concealment rate by the loop formation. In addition, when the die length of one loop formation related to "the die length of a loop formation" exceeds especially 2mm 3mm, the concealment operation by itself comes to be conspicuous in this the "regularity of loop-formation arrangement", in viewing. Moreover, since fiber becomes [ a rose \*\*\*\* loop formation ] thicker as mentioned above since the restraint which the concealment area of its situation also becomes large, and is produce by immobilization in the base material section stops act on the whole loop formation when a loop formation becomes long, or a free part becomes long, it deforms into an irregular form by the ability of a loop formation to be twist, and it becomes arrangement irregular as a whole, and is hard come to are visible more than an actual concealment rate.

[0009] On the other hand, as a front seat in an actual disposable diaper, as shown in drawing 10 or drawing 11, the hook receptacle element which consists of a grid reticulum 20 which was fixed to the front face of base material section 5b to which the target was given, and this base material section 5b, and which was composed so that much loop-formation 5a and 5a-- might bulge is used. Thus, with the gestalt of loop-formation 5a to base material section 5b, and 5a-- with which adhesive strength is compensated by the grid reticulated part, "dimension height of warp partial 5c and 5d of weft parts", and "warp partial spacing and weft partial spacing" in grid reticulated material influence the conspicuousness of the target of base material section 5b. The effect of latter is the same as that of the number density of a loop formation.



[0010] Thus, although it turns out that all the above-mentioned factors are acting in multiplication when it sees, the dimension height of a loop formation and the effect of number density are large especially too. However, when dimension height of the loop formation in the conventional hook receptacle element is only lessened or number density is only lessened, the engagement force with a hook element declines and an original firm attachment function may be spoiled. When number density is raised too much, it becomes impossible for this trouble to solve the problem of spoiling the conspicuousness of a base material section target on the contrary, although it is solvable by raising the number density of a loop formation.

[0011] This invention is made based on these knowledge, and the configuration of degree account is used for it.

The surface fastener by the combination of a <according to claim 1 invention> hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element it consists of the base material section which has the target which can be checked by looking from a front-face side, and a loop formation of a large number fixed to the front face of this base material section, and each aforementioned loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

the <operation effectiveness> -- as the yarn with which invention according to claim 1 constitutes a loop formation -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- by using the filament yarn curved gently, even when the yarn of the number of the same filament is used, remarkably, concealment area becomes small and a target becomes more legible. A target can be made more legible, without dropping reinforcement, without [ therefore ] this changing the size and number of filament yarn.

[0012] <Invention according to claim 2> Disposable diaper with which the number density of said loop formation has the front seat for firm attachment according to claim 1 set to 2 cm 10-60 pieces / the <operation effectiveness> -- considering as this loop-formation number density range -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- even if it uses the filament yarn curved gently, sufficient firm attachment force is demonstrated. Moreover, if the number density of a loop formation is in this range, and it glances, it will be thought that a masking effect becomes large by dense arrangement, but since it is visible to the feeling of a material of the base material section itself closely when it actually views, a lower target becomes legible on the contrary rather than elegance conventionally by which the loop formation has been arranged at non-denses.

[0013] The surface fastener by the combination of a <according to claim 3 invention> hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element Were fixed to the front face of the base material section which has the target which can be checked by looking from a front-face side, and this base material section. the grid reticulum which consists of a grid reticulum composed so that many loop formations might bulge, and includes said loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

the <operation effectiveness> -- all the yarn with which invention according to claim 3 exists on the base material section about the example which compensates the adhesive strength of a loop formation to the base material section with a grid reticulated part as mentioned above in this case -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- the target of the lower base material section can be made legible by considering as the filament yarn curved gently.

[0014] <Invention according to claim 4> Disposable diaper which has the front seat for firm attachment according to claim 3 with which warp partial spacing in said grid reticulum was set to 1.5mm or less,

and weft partial spacing was set to 3.0mm or less while 10-60 number density /of said loop formation was set to 2 cm.

The <operation effectiveness> In this way, while setting 10-60 number density /of a loop formation to 2 cm, by forming a loop formation and a grid densely rather than elegance conventionally, setting warp partial spacing to 1.5mm or less, and using weft partial spacing as 3.0mm or less, like invention according to claim 2, a lower target becomes legible on the contrary, and the bond strength to the base material section and the advantage which becomes high are brought about.

[0015] <Invention according to claim 5> Disposable diaper given in any 1 term of claims 1-4 which is making the gestalt which bulge and is in sight in the same direction of said loop formation predetermined 60% or more when said hook receptacle element is seen superficially.

The <operation effectiveness> It becomes easy to be visible more than a concealment rate actual as mentioned above with [ a loop formation ] regular arrangement in this way.

[0016] <Invention according to claim 6> Disposable diaper with which light transmittance of said hook receptacle element simple substance was made into 60% or less and which has the front seat for firm attachment of a publication in any 1 term of claims 1-5.

The <operation effectiveness> The target of the base material section will become legible by making light transmittance into the above-mentioned range, combining the above-mentioned this invention configuration suitably.

[0017] <Invention according to claim 7> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-6 which fixed said loop formation to said base material section with polyurethane adhesive.

The <operation effectiveness> By using these adhesives, the feeling of gloss of a base material section front face can be stopped, it has, and the target of the base material section becomes more legible.

[0018] <Invention according to claim 8> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-7 made into the thing of the design to which said target expresses two or more different firm attachment locations in the direction of a periphery.

The <operation effectiveness> By giving this design, there is an advantage which the standard of the bolting degree at the time of firm attachment comes to understand easily.

[0019] <Invention according to claim 9> Disposable diaper with which the target to said base material section has the front seat for firm attachment of a publication in any 1 term of claims 1-8 formed of gravure or flexographic printing.

It recommends forming using gravure or flexographic printing as a target of <operation effectiveness> this invention.

[0020] The front face of said hook element attached firmly to both <invention according to claim 10>, and the front face of said hook receptacle element The shearing force which becomes settled as force taken to shift relatively [ direction / along both front faces ] is 100g or more. The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose exfoliation force which becomes settled as force taken to tear off the front face of said hook element attached firmly mutually and the front face of said hook receptacle element in the direction which intersects perpendicularly with both front faces is 10g or more.

The <operation effectiveness> Although the target under it can be made legible by the above-mentioned configuration though the firm attachment force by the loop formation is fully maintained, it is desirable to design so that it may have the shearing force and the exfoliation force of the above-mentioned range as concrete firm attachment force.

[0021] The "shear strength test method" and the "peel strength test method" which are said to this invention are defined here as follows.

(\*\*) -- as shown in shear strength test-method \*\* drawing 12, the whole partial surface which has the hook of the hook element 6 cut out from the product to the hook receptacle element (front seat) 5 cut out from the disposable diaper product to 40mmx100mm is stuck. At this time, like [ the sense of the hook receptacle element 5 to the hook element 6 ] the time of product use, it sticks so that the lengthwise direction in the product condition of the hook receptacle element 5 and the lengthwise direction in the

product condition of the hook element 6 may become parallel.

\*\* After an appropriate time, it is the posture in which the longitudinal direction in a product condition meets a lengthwise direction, and to the chuck c1 on a tension tester, adjust so that the vertical chuck c1 and the distance cy between c2 may be set to 50mm, and a lower chuck pinches a non-engage part [ in / for the end face section which does not have the hook in the hook element 6 / the hook receptacle element 5 ], and measure by it by pull to a shear direction by speed of testing 300 mm/min.

\*\* The peak of the beginning of the obtained chart is read and let this be the shear strength.

[0022] (b) As shown in peel strength test-method \*\* drawing 13 , make into a table the side which has a loop formation for the hook receptacle element (front seat) 5 cut out from the disposable diaper product to 40mmx100mm, and stick a rear face on a stainless plate st with a double-sided tape. A front face fixes to a stainless plate st from \*\* the edge which is not being fixed on the Kraft tape.

\*\* Next, stick the whole partial surface which has the hook of the hook element 6 cut out of a product on the front face of the stuck hook receptacle element 5. At this time, like [ the sense of the hook element 6 to the hook receptacle element 5 ] the time of product use, it sticks so that the lengthwise direction in the product condition of the hook receptacle element 5 and the lengthwise direction in the product condition of the hook element 6 may become parallel. The above-mentioned lengthwise direction is made to carry out 1 \*\*\*\* of rollers with a mass of 2kg, and the hook element 5 and the hook receptacle element 6 are made engaged after an appropriate time.

\*\* Next, these stainless plates st, and 5 and 6 are fixed to the edge of Table tb etc., and end face section side 7 which does not have the hook of the hook element 6 is bent and hung from tb edge of a table, stick the end section of the Kraft tape ct on the hanging part, attach the 1kg weight G in the other end of the Kraft tape ct, and apply a load for 2 seconds.

\*\* Subsequently, remove a load, carry the hook receptacle element in the condition that the hook element was engaged into the tension tester which is not illustrated with a stainless plate, and measure by the exfoliation include angle of 90 degrees, and speed-of-testing 300 mm/min. This condition is shown in drawing 13 (b).

\*\* Except for maximum and the minimum value, it reads each the maximum peak from the remaining peaks, and the three minimum peaks (a total of six points) in the obtained chart, calculate the average, and make this into shearing force.

[0023] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose sound when exfoliating said hook element attached firmly to both <invention according to claim 11> and said hook receptacle element is 15.0 sones or less.

If the <operation effectiveness> firm attachment force is raised, since the sound at the time of exfoliation tends to become excessive and tends to become jarring, it is desirable to design so that an exfoliation sound may be settled in the above-mentioned range. The loudness level (sone) said to this invention here is the value which measures the sound at the time of exfoliation with an ordinary sound level meter, assigns this value (phone) at the following type (1), and can be found.

[Equation 1]

$$S_{(y-y)} = 2^{\frac{P(\text{㉞})-40}{10}} \dots (1)$$

[0024] <Invention according to claim 12> Disposable diaper with which the permeability according [ said hook receptacle element ] to the JIS-P-8117:gar rhe method has the front seat for firm attachment of a publication in any 1 term of claims 1-11 made into 9.0sec / thing 100ml or more.

If it is in the range which requires the <operation effectiveness> permeability, even if it prepares a hook receptacle element in a venter, sufficient permeability will be secured, and it will become that it is hard to make a wearer sense displeasure. When also giving permeability to a non-liquid-permeable nature sheet, the permeability in the part of the front seat for firm attachment is not spoiled.

[0025] <Invention according to claim 13> Disposable diaper with which the moisture permeability according [ said hook receptacle element ] to the JIS-L-1099:MVTR method has the front seat for firm

attachment of a publication in any 1 term of claims 1-12 carried out to more than 500g/m<sup>2</sup> and d. If it is in the range which requires the <operation effectiveness> moisture permeability, even if it prepares a hook receptacle element in a venter, sufficient moisture permeability will be secured, and it will become that it is hard to make a wearer sense displeasure. When also giving moisture permeability to a non-liquid-permeable nature sheet, moisture permeability in the part of the front seat for firm attachment is not spoiled.

[0026] <Invention according to claim 14> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-12 which performed piloerection processing to the hook receptacle element front face which has said loop formation.

The <operation effectiveness> By performing this piloerection processing, a loop formation is pulled out and the engagement force with a hook element improves by that of rose \*\*\*\*. In this case, although a target becomes hard to see a little rather than what does not perform piloerection processing, conspicuoussness can be raised and the effect on the conspicuoussness by piloerection processing can be made to offset by [ which use the filament yarn which performed crimp processing ] reducing a loop-formation consistency, since it is more remarkably [ conventionally / than elegance ] legible and the firm attachment force improves by piloerection processing.

[0027] <according to claim 15 invention> each loop formation of non-crimp processing is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-14 currently formed from the filament yarn curved gently.

[0028] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-15 whose quality of the materials of <according to claim 16 invention> filament yarn are nylon.

the <operation effectiveness> -- straight -- again -- \*\* -- the filament yarn curved gently excels [ thing / of non-crimp processing ] in visibility. Moreover, it excels that the quality of the material of filament yarn is nylon in respect of the firm attachment nature of a hook element etc.

[0029]

[Embodiment of the Invention] It explains in full detail further, referring to the gestalt of the operation which shows this invention below to a drawing. Drawing 1 - drawing 4 are what showed the 1st example. The body of a disposable diaper The liquid permeability top sheet 1 which consists of a nonwoven fabric by the side of a front face (field equivalent to the skin) etc., The non-liquid-permeable nature backseat 2 which consists of a poly lamination nonwoven fabric which consists of a polyethylene sheet on the back etc., and with which an inside side consists of a polyethylene sheet etc. more preferably, and an external surface side consists of a nonwoven fabric, The absorber 3 which consists of curdy pulp which left the perimeter part as the flap section and intervened among them is used as the basic component. It is desirable to use what gave this permeability and moisture permeability by forming many fine needle holes here for the non-liquid-permeable nature backseat 2 which consists of a poly lamination nonwoven fabric.

[0030] An absorber 3 is adjoined and 1 or two or more elastic flexible member 4A is prepared in the circumference part of a foot as occasion demands. Elastic flexible member 4B for order leakage prevention is prepared in an order edge as occasion demands. The gestalt of illustration is more desirably established as barrier cuffs (called standing-up cuffs), although an absorber 3 is adjoined and 1 or two or more elastic flexible member 4A is prepared in the circumference part of a foot as flat-surface gathers.

[0031] Although this kind of body of a disposable diaper is well-known, in this invention, the hook receptacle sheet (slag carrier sheet) 5 which constitutes the hook receptacle element with which much loop-formation 5a projects in base material 5b is fixed to the external surface of Abdomen S by the non-liquid-permeable nature backseat 2 as the so-called front seat. However, loop-formation 5a of the hook receptacle sheet 5 shown in drawing 1 has opted for size or arrangement, in order to make a drawing legible, and it does not have correlation with the range of this invention mentioned later.

[0032] On the other hand, other one element of a surface fastener is being fixed to \*\*\*\*\* for Back B. In the example, \*\*\*\*\* is constituted by a backseat 2 and the top sheet 1, Back B juts over the front

face of a backseat 2 out of the side edge at the method of outside, binder layer 6A is fixed and the subtape member 7 is formed [ the main tape member 6 ] for both ends by binder layer 7A in the state of immobilization between the front-face side of the top sheet 1, and the inside side of the main tape member 6 over the side edge. The hook sheet 8 which constitutes the hook element of a surface fastener is being fixed to a part for the inside flank in which the subtape member 7 of said main tape member 6 does not exist by for example, binder layer 8A. The hook sheet 8 implants much piece of hook 8a in base material 8b, and piece of hook 8a has the relation in which said loop-formation 5a and engaging and releasing are free. Moreover, preferably, by preparing inside from the tip of the main tape member 6, the hook sheet 8 pinches a point and has left it as the section.

[0033] On the other hand, it consider as the condition of having fold up the main tape member 6 inside the product at the time of un-equip, and be engage with the fiber of the top sheet 1 as for which the hook sheet 8 consist of a nonwoven fabric in the location exceeding the subtape member 7 whole in that case as be show at a part of subtape member 7 or drawing 5 in the condition of having been involved free [ exfoliation ] as show in drawing 4 . While fixing only the end face section and the side edge section of a backseat 2, and a corresponding part to a backseat 2 through the binder layers n1 and n2 only using the main tape member 6 as shown in drawing 14 in order to lessen configuration parts more The adhesion material layer n3 is formed in the pars intermedia by the side of a tip rather than the piece of hook 8a part in the main tape member 6, and where the main tape member 6 is folded up inside a product at the time of un-equipping, it can also fix to the product inside by the binder layer n3 of a point.

[0034] After the main tape member 6 which has the hook sheet 8, and the subtape member 7 are attached in the body of a disposable diaper in this disposable diaper, as shown in drawing 4 The main tape member 6 is made into the condition of having folded up inside the disposable diaper, the hook sheet 8 is twined around the fiber of the top sheet 1 which consists of a nonwoven fabric in the location exceeding a part of subtape member 7, and it is engaged, and a production process is advanced further and shipped after making a load. At the time of wearing of a disposable diaper, the tip of the main tape member 6 is gathered, the hook sheet 8 is exfoliated from the top sheet 1, the extension part is carried into Venter S, and the hook sheet 8 is piled up on the hook receptacle sheet 5. Association before and behind a disposable diaper is made for each piece of hook 8a by this superposition involving each loop-formation 5a. What is necessary is to remove the extension section of the hook sheet 8 from the hook receptacle sheet 5, and just to recombine it on the occasion of the check of the existence of urination, or redo of wearing.

[0035] In the above-mentioned example, although the hook sheet 8 was fixed to the main tape member 6 in binder 8A, base material 8b of the hook sheet 8 can also be fixed to the main tape member 6 by heat joining etc., without being based on binder layer 8A. The hook sheet 8 can keep spacing along with the longitudinal direction of the main tape member 6, and can also prepare it. [ two or more ] although two zipper tapes of the main tape member 6 which has the hook sheet 8, and the subtape member 7 were prepared to one both-sides section of a disposable diaper, they can be made into one (or the applications for small children etc. -- responding), or 3 or more according to bonding strength, as shown in drawing 1 and drawing 2 . Moreover, as shown in drawing 6 , the hook receptacle sheet 5 may be arranged to a venter corresponding to an individual exception.

[0036] In this invention, the hook receptacle sheet 5 which constitutes the hook receptacle element with which much loop-formation 5a projects on a base material section 5b front face as a cross section shows to drawing 7 is fixed with hot melt adhesive 11 on the non-liquid-permeable nature backseat 2 as above-mentioned. In this case, after giving a target directly to the front face of the base material sheet which constitutes base material section 5b with well-known printing means, such as gravure and flexographic printing, like illustration, it is desirable to fix a loop formation to that front face by hot melt adhesive etc. A target can also be attached to the rear face of a base material sheet, and the base material sheet itself is formed for transparency or a translucent material in that case. As this base material sheet 5b, things with a thickness of 25 micrometers or less also including printing thickness are desirable, and polyethylene is desirable as the quality of the material.

[0037] Moreover, as a cross section shows, the hook receptacle sheet 5 is not directly fixed to drawing 8

at the non-liquid-permeable nature backseat 2. In the location which should fix the hook receptacle sheet 5, the printing film 10 with which the target 9 of the firm attachment location of said hook element 8 was printed at the external surface side. For example, while fixing to the non-liquid-permeable nature backseat 2 with hot melt adhesive 11 and carrying out the laminating (sign 12 shows heat joining layer) unification of the hook receptacle sheet 5 by heat joining on the printing film 10. The hook receptacle sheet 5 can also be made transparent or translucent in order to make it said target 9 appear from the outside. In this case, the printing film 10 also constitutes the base material section of this invention. In this way, the check by looking of said target 9 is attained from the exterior through the hook receptacle sheet 5, and the firm attachment location of said hook element 8 can be chosen according to a target 9. It is desirable to be able to display by the figure, the mark, the classification-by-color band, or the line, and to form the target 9 which consists of a band-like design classified by color so that two or more firm attachment locations which are different in the direction of a periphery as shown in drawing 9 might be expressed especially by these as a target 9. In addition, in drawing 9, classification by color and a loop formation are omitted for the conspicuousness of a drawing. However, in this invention, many loop formations are established on the hook receptacle sheet 5 like the following \*\*.

[0039] and as this invention especially shows a flat surface to drawing 10, non-crimp processing is straight in all loop-formations 5a and 5a-- again -- \*\* -- it forms with the filament yarn curved gently. When the filament yarn which consists of a filament of a size comparable as elegance conventionally is used, all abbreviation is set to about 200 micrometers or less although it cannot generally crawl on the size of a loop formation. it starts in this invention -- straight -- again -- \*\* -- by using the filament yarn curved gently, compared with the contrast Fig. of the conventional article of drawing 11, the concealment area by loop formations 5a and 5a becomes remarkably small so that clearly, and the target 9 of base material section 5b becomes legible in spite of existence of loop-formation 5a and 5a-- however -- since the engagement force with a hook becomes weak by having not carried out crimp processing to it being only this -- the number density of loop-formation 5a and 5a-- 10-60 -- it is suitably desirable 2 and to carry out to two or more [ 40-50 //cm ] suitably especially cm 30-60 pieces /. If it is in the range of loop-formation 5a and 5a-- which requires number density, not to mention it will spoil the conspicuousness of the lower target 9 as above-mentioned, it becomes legible on the contrary.

[0040] Moreover, base material section 5b which has like illustration the target 9 which can be checked by looking from a front-face side, In using the hook receptacle element which consists of 5 Ns of grid reticulus which were fixed to the front face of this base material section 5b, and which were composed so that much loop-formation 5a might bulge non-crimp processing is straight in the 5Ns of the whole (namely, warp partial 5c, 5d of weft parts, all of loop-formation 5a) grid reticulum -- again -- \*\* -- if it forms with the filament yarn curved gently, the target 9 of lower base material section 5b will become legible. In this case, not to mention it spoils the conspicuousness of the lower target 9 as above-mentioned by making especially 0.7-1.3mm and the weft partial spacing x for the warp partial spacing y in the grid reticulum 20 of loop-formation 5a and 5a-- while making number density with the above-mentioned range with 1.5-1.8mm 3.0mm or less 1.5mm or less, it becomes legible on the contrary. In this case, as for the superintendent officer of a grid reticulum, it is desirable that it is 25.0 - 34.0 g/m<sup>2</sup>.

[0041] Especially nylon is desirable, although about ten thin filaments f boiled so that filament yarn may be expanded and it may be shown are bundled here and polyethylene terephthalate (PET), nylon, etc. can use all well-known things as the quality of the material here. As a color of filament yarn, the thing of white, translucence, or transparency is desirable. In order to make legible the target 9 of base material section 5b furthermore, when a hook receptacle element is seen superficially, it is desirable that 80 - 90% or more makes especially the gestalt of loop-formation 5a which bulges and (it bulges on left-hand side to the direction of warp in drawing) looks in the same predetermined direction like illustration 60 to 70% or more. For this reason, it is desirable to make it a loop formation not deform irregularly the one die length of loop-formation 5a especially as 2mm or less 3mm or less. Moreover, it is desirable for there to be light transmittance of a hook receptacle element simple substance, and to make it this become 60% or less by this invention as a standard of final conspicuousness. In illustration, loop formations 5a and 5a fix to base material section 5b with hot melt adhesive with a grid reticulum. In this case, as hot

melt adhesive to be used, although a rubber system, a styrene system, and polyurethane adhesive can be used, if polyurethane adhesive is used especially, a feeling of gloss will decrease and a target will become legible more. Especially as coverage of these adhesives, 4.0 - 5.0 g/m<sup>2</sup> is desirable two or more 3.5 g/m.

[0042] On the other hand, as mentioned above, although it can avoid spoiling the fall of the firm attachment force (engagement force) by [ of loop-formation 5a and 5a-- ] increasing number density, it is desirable to set up each above-mentioned factor so that the shearing force by the above-mentioned shear strength test method may be 100g or more as a final standard of this firm attachment force and the exfoliation force by the above-mentioned peel strength test method may be 10g or more. moreover, the hook element front face which has loop-formation 5a and 5a-- in this invention -- receiving -- piloerection processing -- giving -- loop formations 5a and 5a -- some -- pulling out -- some -- rose this morning -- \*\*\*\* -- the engagement force with a hook element can be raised by things. In this case, since the firm attachment force improves, conspicuousness can be raised and the effect on the conspicuousness by piloerection processing can be made to offset by reducing a loop-formation consistency. the permeability according to the JIS-P-8117:gar rhe method by what many detailed bores or hollow holes are prepared for in dispersion as other additional processings as opposed to the hook receptacle element in this invention (not shown) -- 9.0sec(s) / 100ml, and JIS-L-1099:MVTR -- considering as the thing 500 g/m<sup>2</sup> and more than d also has the desirable moisture permeability by law (calcium chloride method).

[0043]

[Effect of the Invention] According to this invention the above passage, it is in some which make a field zipper tape the firm attachment means of a disposable diaper, and the target of the base material section of a hook receptacle element becomes legible in spite of concealment by the loop formation.

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[Translation done.]

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2. \*\*\*\* shows the word which can not be translated.
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TECHNICAL FIELD

[Field of the Invention] This invention relates to the disposable diaper with which it equipped using the surface fastener (usually called the Velcro fastener (trademark) or a piece of Velcro (trademark)) which can be detached and attached, and which performs engagement to a hook element and a hook carrier element.

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[Translation done.]



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PRIOR ART

[Description of the Prior Art] Generally, the thing using the binder as a tape fastener in the case of equipping the person for covering with a disposable diaper is making the mainstream. He is trying to join together with the above-mentioned surface fastener in a diaper cover. When using this surface fastener, many times attachment and detachment are possible, and it is convenient. On the other hand, an adhesive tape fastener is fixed to the both-sides section of a disposable diaper, a front seat is fixed to the backseat front face of the venter of a disposable diaper with a large area, an adhesive tape fastener is attached firmly to this front seat, and the thing of the structure which can readjust an attaching position is used widely. In this case, what kept spacing in the direction of the circumference of an antinode of a front tape, and formed the target (mark) by printing for the facilities of the firm attachment location of an adhesive tape fastener is known. Although the thing of the structure which attached the adhesive tape fastener firmly to the front seat has the advantage which can adjust the attaching position of a tape fastener, after once removing after wear and checking the existence of urination, when it fixes to a front seat, the firm attachment reinforcement of a binder falls again. Furthermore, originally, in order to depend on the bond strength by the binder, in the disposable diaper for the adult who has a large area, it becomes insufficient [ reinforcement ], and is easy to produce peeling.

[0003] If this point and a surface fastener are used, even if large engagement reinforcement will be obtained and it will repeat attachment and detachment, there is an advantage that there is no fall of engagement reinforcement. As a surface fastener in this case, a hook element consists of a projection of the shape of much reverse RE character, or fungoid, a hook receptacle element consists of a loop formation of an abbreviation semicircle arc of a large number by which both ends were fixed to the base material section front face, and, generally what both elements can detach and attach freely mechanically not by adhesion or chemical association but by tangle (exfoliation) is used. And the filament yarn (a single filament is illustrated by f) with which crimp processing (bulky processing) was performed as loop-formation 5a and 5a-- is used, and a firm tangle to a hook element is realized by the loft so that it may expand to drawing 11 and may be shown conventionally. Moreover, when replacing with a front tape in this way and using a surface fastener, what formed the aforementioned target in base material section 5b is marketed.

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[Translation done.]

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EFFECT OF THE INVENTION

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[Effect of the Invention] According to this invention the above passage, it is in some which make a field zipper tape the firm attachment means of a disposable diaper, and the target of the base material section of a hook receptacle element becomes legible in spite of concealment by the loop formation.

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[Translation done.]

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, with the hook receptacle element of the conventional surface fastener, as "dimension height of the yarn which constitutes a loop formation" showed to drawing 11 , even if the target (not shown) of a base material section 5b front face will be concealed by much loop-formation 5a of a base material section front face, and 5a-- in dispersion and it mainly gave the character, a design pattern, etc. as a target by them, there was a trouble that it could not be seen vividly.

[0005] Therefore, the technical problem of this invention is one of those which make a field zipper tape the firm attachment means of a disposable diaper, and is to make legible the target of the base material section of a hook receptacle element. Other technical problems are also in the front seat part for firm attachment to offer the product which has permeability.

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[Translation done.]

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## MEANS

[Means for Solving the Problem] According to the place which this invention persons studied wholeheartedly, it became clear that there were mainly "dimension height of the yarn which constitutes a loop formation", "the number density (the number of the loop formations per unit area) of a loop formation", and "regularity of loop-formation arrangement" as a factor which influences the conspicuousness of the base material section target in the hook receptacle element which has a loop formation. Hereafter, it explains in order of.

[0007] First, "dimension height of the yarn which carries out loop arrangement" is considered to influence the conspicuousness of a target most. Concealment area becomes it excessive that the yarn which constitutes a loop formation like before is filament yarn (refer to the limb of drawing 11) by which crimp processing was carried out, and a lower target becomes hard to see. Although it is hard to decide uniquely since the size of a loop formation is filament yarn, all the abbreviation for the loop formation [ a large number in elegance ] by which crimp processing was carried out serves as about 400 micrometers or more of sizes conventionally. Next, if it exceeds 60 2 [ / ] cm in general, when it will exceed 50 2 [ / ] cm especially, a concealment operation comes to be conspicuous about "number density of a loop formation", in viewing. Moreover, even if a loop formation is too sparse on the contrary, only it comes to be conspicuous and there is an inclination for a lower target to become hard to see. therefore, number density -- 10 piece/cm2 -- suitable -- 30 piece/cm2 -- it carries out to two or more [ 40 //cm ] suitably especially.

[0008] Furthermore, "the regularity of loop-formation arrangement" is important. If loop-formation 5a and 5a-- is regularly arranged as it is shown in drawing 10 to being hard coming to be visible more than an actual concealment rate, when loop-formation 5a and 5a-- is arranged at random, as an a large number loop formation shows drawing 11, it will be easy to assume a concealment part and will sense more legible than an actual concealment rate. The base material section was seen superficially, and if 80 - 90% or more is making especially the gestalt which bulge and is in sight in the same predetermined direction 60% to 70% or more of the a large number loop formation, specifically, it will have become clear that it senses more legible than the actual concealment rate by the loop formation. In addition, when the die length of one loop formation related to "the die length of a loop formation" exceeds especially 2mm 3mm, the concealment operation by itself comes to be conspicuous in this the "regularity of loop-formation arrangement", in viewing. Moreover, since fiber becomes [ a rose \*\*\*\* loop formation ] thicker as mentioned above since the restraint which the concealment area of its situation also becomes large, and is produce by immobilization in the base material section stops act on the whole loop formation when a loop formation becomes long, or a free part becomes long, it deforms into an irregular form by the ability of a loop formation to be twist, and it becomes arrangement irregular as a whole, and is hard come to are visible more than an actual concealment rate.

[0009] On the other hand, as a front seat in an actual disposable diaper, as shown in drawing 10 or drawing 11, the hook receptacle element which consists of a grid reticulum 20 which was fixed to the front face of base material section 5b to which the target was given, and this base material section 5b, and which was composed so that much loop-formation 5a and 5a-- might bulge is used. Thus, with the

gestalt of loop-formation 5a to base material section 5b, and 5a-- with which adhesive strength is compensated by the grid reticulated part, "dimension height of warp partial 5c and 5d of weft parts", and "warp partial spacing and weft partial spacing" in grid reticulated material influence the conspicuousness of the target of base material section 5b. The effect of latter is the same as that of the number density of a loop formation.

[0010] Thus, although it turns out that all the above-mentioned factors are acting in multiplication when it sees, the dimension height of a loop formation and the effect of number density are large especially too. However, when dimension height of the loop formation in the conventional hook receptacle element is only lessened or number density is only lessened, the engagement force with a hook element declines and an original firm attachment function may be spoiled. When number density is raised too much, it becomes impossible for this trouble to solve the problem of spoiling the conspicuousness of a base material section target on the contrary, although it is solvable by raising the number density of a loop formation.

[0011] This invention is made based on these knowledge, and the configuration of degree account is used for it.

The surface fastener by the combination of a <according to claim 1 invention> hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element it consists of the base material section which has the target which can be checked by looking from a front-face side, and a loop formation of a large number fixed to the front face of this base material section, and each aforementioned loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

the <operation effectiveness> -- as the yarn with which invention according to claim 1 constitutes a loop formation -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- by using the filament yarn curved gently, even when the yarn of the number of the same filament is used, remarkably, concealment area becomes small and a target becomes more legible. A target can be made more legible, without dropping reinforcement, without [ therefore ] this changing the size and number of filament yarn.

[00121] <Invention according to claim 2> Disposable diaper with which the number density of said loop formation has the front seat for firm attachment according to claim 1 set to 2 cm 10-60 pieces /. the <operation effectiveness> -- considering as this loop-formation number density range -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- even if it uses the filament yarn curved gently, sufficient firm attachment force is demonstrated. Moreover, if the number density of a loop formation is in this range, and it glances, it will be thought that a masking effect becomes large by dense arrangement, but since it is visible to the feeling of a material of the base material section itself closely when it actually views, a lower target becomes legible on the contrary rather than elegance conventionally by which the loop formation has been arranged at non-denses.

[0013] The surface fastener by the combination of a <according to claim 3 invention> hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element Were fixed to the front face of the base material section which has the target which can be checked by looking from a front-face side, and this base material section. the grid reticulum which consists of a grid reticulum composed so that many loop formations might bulge, and includes said loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

the <operation effectiveness> -- all the yarn with which invention according to claim 3 exists on the base material section about the example which compensates the adhesive strength of a loop formation to the

base material section with a grid reticulated part as mentioned above in this case -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- the target of the lower base material section can be made legible by considering as the filament yarn curved gently.

[0014] <Invention according to claim 4> Disposable diaper which has the front seat for firm attachment according to claim 3 with which warp partial spacing in said grid reticulum was set to 1.5mm or less, and weft partial spacing was set to 3.0mm or less while 10-60 number density /of said loop formation was set to 2 cm.

The <operation effectiveness> In this way, while setting 10-60 number density /of a loop formation to 2 cm, by forming a loop formation and a grid densely rather than elegance conventionally, setting warp partial spacing to 1.5mm or less, and using weft partial spacing as 3.0mm or less, like invention according to claim 2, a lower target becomes legible on the contrary, and the bond strength to the base material section and the advantage which becomes high are brought about.

[0015] <Invention according to claim 5> Disposable diaper given in any 1 term of claims 1-4 which is making the gestalt which bulge and is in sight in the same direction of said loop formation predetermined 60% or more when said hook receptacle element is seen superficially.

The <operation effectiveness> It becomes easy to be visible more than a concealment rate actual as mentioned above with [ a loop formation ] regular arrangement in this way.

[0016] <Invention according to claim 6> Disposable diaper with which light transmittance of said hook receptacle element simple substance was made into 60% or less and which has the front seat for firm attachment of a publication in any 1 term of claims 1-5.

The <operation effectiveness> The target of the base material section will become legible by making light transmittance into the above-mentioned range, combining the above-mentioned this invention configuration suitably.

[0017] <Invention according to claim 7> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-6 which fixed said loop formation to said base material section with polyurethane adhesive.

The <operation effectiveness> By using these adhesives, the feeling of gloss of a base material section front face can be stopped, it has, and the target of the base material section becomes more legible.

[0018] <Invention according to claim 8> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-7 made into the thing of the design to which said target expresses two or more different firm attachment locations in the direction of a periphery.

The <operation effectiveness> By giving this design, there is an advantage which the standard of the bolting degree at the time of firm attachment comes to understand easily.

[0019] <Invention according to claim 9> Disposable diaper with which the target to said base material section has the front seat for firm attachment of a publication in any 1 term of claims 1-8 formed of gravure or flexographic printing.

It recommends forming using gravure or flexographic printing as a target of <operation effectiveness> this invention.

[0020] The front face of said hook element attached firmly to both <invention according to claim 10>, and the front face of said hook receptacle element The shearing force which becomes settled as force taken to shift relatively [ direction / along both front faces ] is 100g or more. The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose exfoliation force which becomes settled as force taken to tear off the front face of said hook element attached firmly mutually and the front face of said hook receptacle element in the direction which intersects perpendicularly with both front faces is 10g or more.

The <operation effectiveness> Although the target under it can be made legible by the above-mentioned configuration though the firm attachment force by the loop formation is fully maintained, it is desirable to design so that it may have the shearing force and the exfoliation force of the above-mentioned range as concrete firm attachment force.

[0021] The "shear strength test method" and the "peel strength test method" which are said to this invention are defined here as follows.

(\*\*) -- as shown in shear strength test-method \*\* drawing 12 , the whole partial surface which has the hook of the hook element 6 cut out from the product to the hook receptacle element (front seat) 5 cut out from the disposable diaper product to 40mmx100mm is stuck. At this time, like [ the sense of the hook receptacle element 5 to the hook element 6 ] the time of product use, it sticks so that the lengthwise direction in the product condition of the hook receptacle element 5 and the lengthwise direction in the product condition of the hook element 6 may become parallel.

\*\* After an appropriate time, it is the posture in which the longitudinal direction in a product condition meets a lengthwise direction, and to the chuck c1 on a tension tester, adjust so that the vertical chuck c1 and the distance cy between c2 may be set to 50mm, and a lower chuck pinches a non-engage part [ in / for the end face section which does not have the hook in the hook element 6 / the hook receptacle element 5 ], and measure by it by pull to a shear direction by speed of testing 300 mm/min.

\*\* The peak of the beginning of the obtained chart is read and let this be the shear strength.  
[0022] (b) As shown in peel strength test-method \*\* drawing 13 , make into a table the side which has a loop formation for the hook receptacle element (front seat) 5 cut out from the disposable diaper product to 40mmx100mm, and stick a rear face on a stainless plate st with a double-sided tape. A front face fixes to a stainless plate st from \*\* the edge which is not being fixed on the Kraft tape.

\*\* Next, stick the whole partial surface which has the hook of the hook element 6 cut out of a product on the front face of the stuck hook receptacle element 5. At this time, like [ the sense of the hook element 6 to the hook receptacle element 5 ] the time of product use, it sticks so that the lengthwise direction in the product condition of the hook receptacle element 5 and the lengthwise direction in the product condition of the hook element 6 may become parallel. The above-mentioned lengthwise direction is made to carry out 1 \*\*\*\* of rollers with a mass of 2kg, and the hook element 5 and the hook receptacle element 6 are made engaged after an appropriate time.

\*\* Next, these stainless plates st, and 5 and 6 are fixed to the edge of Table tb etc., and end face section side 7 which does not have the hook of the hook element 6 is bent and hung from tb edge of a table, stick the end section of the Kraft tape ct on the hanging part, attach the 1kg weight G in the other end of the Kraft tape ct, and apply a load for 2 seconds.

\*\* Subsequently, remove a load, carry the hook receptacle element in the condition that the hook element was engaged into the tension tester which is not illustrated with a stainless plate, and measure by the exfoliation include angle of 90 degrees, and speed-of-testing 300 mm/min. This condition is shown in drawing 13 (b).

\*\* Except for maximum and the minimum value, it reads each the maximum peak from the remaining peaks, and the three minimum peaks (a total of six points) in the obtained chart, calculate the average, and make this into shearing force.

[0023] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose sound when exfoliating said hook element attached firmly to both <invention according to claim 11> and said hook receptacle element is 15.0 sones or less.

If the <operation effectiveness> firm attachment force is raised, since the sound at the time of exfoliation tends to become excessive and tends to become jarring, it is desirable to design so that an exfoliation sound may be settled in the above-mentioned range. The loudness level (sone) said to this invention here is the value which measures the sound at the time of exfoliation with an ordinary sound level meter, assigns this value (phone) at the following type (1), and can be found.

[Equation 1]

$$S_{(y-j)} = 2^{\frac{P(\>) - 40}{10}} \dots (1)$$

[0024] <Invention according to claim 12> Disposable diaper with which the permeability according [ said hook receptacle element ] to the JIS-P-8117:gar rhe method has the front seat for firm attachment of a publication in any 1 term of claims 1-11 made into 9.0sec / thing 100ml or more.

If it is in the range which requires the <operation effectiveness> permeability, even if it prepares a hook

receptacle element in a venter, sufficient permeability will be secured, and it will become that it is hard to make a wearer sense displeasure. When also giving permeability to a non-liquid-permeable nature sheet, the permeability in the part of the front seat for firm attachment is not spoiled.

[0025] <Invention according to claim 13> Disposable diaper with which the moisture permeability according [ said hook receptacle element ] to the JIS-L-1099:MVTR method has the front seat for firm attachment of a publication in any 1 term of claims 1-12 carried out to more than 500g/m<sup>2</sup> 2 and d. If it is in the range which requires the <operation effectiveness> moisture permeability, even if it prepares a hook receptacle element in a venter, sufficient moisture permeability will be secured, and it will become that it is hard to make a wearer sense displeasure. When also giving moisture permeability to a non-liquid-permeable nature sheet, moisture permeability in the part of the front seat for firm attachment is not spoiled.

[0026] <Invention according to claim 14> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-12 which performed piloerection processing to the hook receptacle element front face which has said loop formation.

The <operation effectiveness> By performing this piloerection processing, a loop formation is pulled out and the engagement force with a hook element improves by that of rose \*\*\*\*. In this case, although a target becomes hard to see a little rather than what does not perform piloerection processing, conspicuousness can be raised and the effect on the conspicuousness by piloerection processing can be made to offset by [ which use the filament yarn which performed crimp processing ] reducing a loop-formation consistency, since it is more remarkably [ conventionally / than elegance ] legible and the firm attachment force improves by piloerection processing.

[0027] <according to claim 15 invention> each loop formation of non-crimp processing is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-14 currently formed from the filament yarn curved gently.

[0028] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-15 whose quality of the materials of <according to claim 16 invention> filament yarn are nylon.

the <operation effectiveness> -- straight -- again -- \*\* -- the filament yarn curved gently excels [ thing / of non-crimp processing ] in visibility. Moreover, it excels that the quality of the material of filament yarn is nylon in respect of the firm attachment nature of a hook element etc.

[0029]

[Embodiment of the Invention] It explains in full detail further, referring to the gestalt of the operation which shows this invention below to a drawing. Drawing 1 - drawing 4 are what showed the 1st example. The body of a disposable diaper The liquid permeability top sheet 1 which consists of a nonwoven fabric by the side of a front face (field equivalent to the skin) etc., The non-liquid-permeable nature backseat 2 which consists of a poly lamination nonwoven fabric which consists of a polyethylene sheet on the back etc., and with which an inside side consists of a polyethylene sheet etc. more preferably, and an external surface side consists of a nonwoven fabric, The absorber 3 which consists of curdy pulp which left the perimeter part as the flap section and intervened among them is used as the basic component. It is desirable to use what gave this permeability and moisture permeability by forming many fine needle holes here for the non-liquid-permeable nature backseat 2 which consists of a poly lamination nonwoven fabric.

[0030] An absorber 3 is adjoined and 1 or two or more elastic flexible member 4A is prepared in the circumference part of a foot as occasion demands. Elastic flexible member 4B for order leakage prevention is prepared in an order edge as occasion demands. The gestalt of illustration is more desirably established as barrier cuffs (called standing-up cuffs), although an absorber 3 is adjoined and 1 or two or more elastic flexible member 4A is prepared in the circumference part of a foot as flat-surface gathers.

[0031] Although this kind of body of a disposable diaper is well-known, in this invention, the hook receptacle sheet (slag carrier sheet) 5 which constitutes the hook receptacle element with which much loop-formation 5a projects in base material 5b is fixed to the external surface of Abdomen S by the non-



liquid-permeable nature backseat 2 as the so-called front seat. However, loop-formation 5a of the hook receptacle sheet 5 shown in drawing 1 has opted for size or arrangement, in order to make a drawing legible, and it does not have correlation with the range of this invention mentioned later.

[0032] On the other hand, other one element of a surface fastener is being fixed to \*\*\*\*\* for Back B. In the example, \*\*\*\*\* is constituted by a backseat 2 and the top sheet 1, Back B juts over the front face of a backseat 2 out of the side edge at the method of outside, binder layer 6A is fixed and the subtape member 7 is formed [ the main tape member 6 ] for both ends by binder layer 7A in the state of immobilization between the front-face side of the top sheet 1, and the inside side of the main tape member 6 over the side edge. The hook sheet 8 which constitutes the hook element of a surface fastener is being fixed to a part for the inside flank in which the subtape member 7 of said main tape member 6 does not exist by, for example, binder layer 8A. The hook sheet 8 implants much piece of hook 8a in base material 8b, and piece of hook 8a has the relation in which said loop-formation 5a and engaging and releasing are free. Moreover, preferably, by preparing inside from the tip of the main tape member 6, the hook sheet 8 pinches a point and has left it as the section.

[0033] On the other hand, it consider as the condition of having fold up the main tape member 6 inside the product at the time of un-equip, and be engage with the fiber of the top sheet 1 as for which the hook sheet 8 consist of a nonwoven fabric in the location exceeding the subtape member 7 whole in that case as be show at a part of subtape member 7 or drawing 5 in the condition of having been involved free [ exfoliation ] as show in drawing 4 . While fixing only the end face section and the side edge section of a backseat 2, and a corresponding part to a backseat 2 through the binder layers n1 and n2 only using the main tape member 6 as shown in drawing 14 in order to lessen configuration parts more The adhesion material layer n3 is formed in the pars intermedia by the side of a tip rather than the piece of hook 8a part in the main tape member 6, and where the main tape member 6 is folded up inside a product at the time of un-equiping, it can also fix to the product inside by the binder layer n3 of a point.

[0034] After the main tape member 6 which has the hook sheet 8, and the subtape member 7 are attached in the body of a disposable diaper in this disposable diaper, as shown in drawing 4 The main tape member 6 is made into the condition of having folded up inside the disposable diaper, the hook sheet 8 is twined around the fiber of the top sheet 1 which consists of a nonwoven fabric in the location exceeding a part of subtape member 7, and it is engaged, and a production process is advanced further and shipped after making a load. At the time of wearing of a disposable diaper, the tip of the main tape member 6 is gathered, the hook sheet 8 is exfoliated from the top sheet 1, the extension part is carried into Venter S, and the hook sheet 8 is piled up on the hook receptacle sheet 5. Association before and behind a disposable diaper is made for each piece of hook 8a by this superposition involving each loop-formation 5a. What is necessary is to remove the extension section of the hook sheet 8 from the hook receptacle sheet 5, and just to recombine it on the occasion of the check of the existence of urination, or redo of wearing.

[0035] In the above-mentioned example, although the hook sheet 8 was fixed to the main tape member 6 in binder 8A, base material 8b of the hook sheet 8 can also be fixed to the main tape member 6 by heat joining etc., without being based on binder layer 8A. The hook sheet 8 can keep spacing along with the longitudinal direction of the main tape member 6, and can also prepare it. [ two or more ] although two zipper tapes of the main tape member 6 which has the hook sheet 8, and the subtape member 7 were prepared to one both-sides section of a disposable diaper, they can be made into one (or the applications for small children etc. -- responding), or 3 or more according to bonding strength, as shown in drawing 1 and drawing 2 . Moreover, as shown in drawing 6 , the hook receptacle sheet 5 may be arranged to a venter corresponding to an individual exception.

[0036] In this invention, the hook receptacle sheet 5 which constitutes the hook receptacle element with which much loop-formation 5a projects on a base material section 5b front face as a cross section shows to drawing 7 is fixed with hot melt adhesive 11 on the non-liquid-permeable nature backseat 2 as above-mentioned. In this case, after giving a target directly to the front face of the base material sheet which constitutes base material section 5b with well-known printing means, such as gravure and flexographic printing, like illustration, it is desirable to fix a loop formation to that front face by hot melt adhesive

etc. A target can also be attached to the rear face of a base material sheet, and the base material sheet itself is formed for transparency or a translucent material in that case. As this base material sheet 5b, things with a thickness of 25 micrometers or less also including printing thickness are desirable, and polyethylene is desirable as the quality of the material.

[0037] Moreover, as a cross section shows, the hook receptacle sheet 5 is not directly fixed to drawing 8 at the non-liquid-permeable nature backseat 2. In the location which should fix the hook receptacle sheet 5, the printing film 10 with which the target 9 of the firm attachment location of said hook element 8 was printed at the external surface side. For example, while fixing to the non-liquid-permeable nature backseat 2 with hot melt adhesive 11 and carrying out the laminating (sign 12 shows heat joining layer) unification of the hook receptacle sheet 5 by heat joining on the printing film 10. The hook receptacle sheet 5 can also be made transparent or translucent in order to make it said target 9 appear from the outside. In this case, the printing film 10 also constitutes the base material section of this invention. In this way, the check by looking of said target 9 is attained from the exterior through the hook receptacle sheet 5, and the firm attachment location of said hook element 8 can be chosen according to a target 9. It is desirable to be able to display by the figure, the mark, the classification-by-color band, or the line, and to form the target 9 which consists of a band-like design classified by color so that two or more firm attachment locations which are different in the direction of a periphery as shown in drawing 9 might be expressed especially by these as a target 9. In addition, in drawing 9, classification by color and a loop formation are omitted for the conspicuousness of a drawing. However, in this invention, many loop formations are established on the hook receptacle sheet 5 like the following \*\*.

[0039] and as this invention especially shows a flat surface to drawing 10, non-crimp processing is straight in all loop-formations 5a and 5a-- again -- \*\* -- it forms with the filament yarn curved gently. When the filament yarn which consists of a filament of a size comparable as elegance conventionally is used, all abbreviation is set to about 200 micrometers or less although it cannot generally crawl on the size of a loop formation. It starts in this invention -- straight -- again -- \*\* -- by using the filament yarn curved gently, compared with the contrast Fig. of the conventional article of drawing 11, the concealment area by loop formations 5a and 5a becomes remarkably small so that clearly, and the target 9 of base material section 5b becomes legible in spite of existence of loop-formation 5a and 5a-- however -- since the engagement force with a hook becomes weak by having not carried out crimp processing to it being only this -- the number density of loop-formation 5a and 5a-- 10-60 -- it is suitably desirable 2 and to carry out to two or more [ 40-50 //cm ] suitably especially cm 30-60 pieces /. If it is in the range of loop-formation 5a and 5a-- which requires number density, not to mention it will spoil the conspicuousness of the lower target 9 as above-mentioned, it becomes legible on the contrary.

[0040] Moreover, base material section 5b which has like illustration the target 9 which can be checked by looking from a front-face side, In using the hook receptacle element which consists of 5 Ns of grid reticulums which were fixed to the front face of this base material section 5b, and which were composed so that much loop-formation 5a might bulge non-crimp processing is straight in the 5Ns of the whole (namely, warp partial 5c, 5d of weft parts, all of loop-formation 5a) grid reticulum -- again -- \*\* -- if it forms with the filament yarn curved gently, the target 9 of lower base material section 5b will become legible. In this case, not to mention it spoils the conspicuousness of the lower target 9 as above-mentioned by making especially 0.7-1.3mm and the weft partial spacing x for the warp partial spacing y in the grid reticulum 20 of loop-formation 5a and 5a-- while making number density with the above-mentioned range with 1.5-1.8mm 3.0mm or less 1.5mm or less, it becomes legible on the contrary. In this case, as for the superintendent officer of a grid reticulum, it is desirable that it is 25.0 - 34.0 g/m2.

[0041] Especially nylon is desirable, although about ten thin filaments f boiled so that filament yarn may be expanded and it may be shown are bundled here and polyethylene terephthalate (PET), nylon, etc. can use all well-known things as the quality of the material here. As a color of filament yarn, the thing of white, translucence, or transparency is desirable. In order to make legible the target 9 of base material section 5b furthermore, when a hook receptacle element is seen superficially, it is desirable that 80 - 90% or more makes especially the gestalt of loop-formation 5a which bulges and (it bulges on left-hand side to the direction of warp in drawing) looks in the same predetermined direction like illustration 60 to

70% or more. For this reason, it is desirable to make it a loop formation not deform irregularly the one die length of loop-formation 5a especially as 2mm or less 3mm or less. Moreover, it is desirable for there to be light transmittance of a hook receptacle element simple substance, and to make it this become 60% or less by this invention as a standard of final conspicuousness. In illustration, loop formations 5a and 5a fix to base material section 5b with hot melt adhesive with a grid reticulum. In this case, as hot melt adhesive to be used, although a rubber system, a styrene system, and polyurethane adhesive can be used, if polyurethane adhesive is used especially, a feeling of gloss will decrease and a target will become legible more. Especially as coverage of these adhesives, 4.0 - 5.0 g/m<sup>2</sup> is desirable two or more 3.5 g/m.

[0042] On the other hand, as mentioned above, although it can avoid spoiling the fall of the firm attachment force (engagement force) by [ of loop-formation 5a and 5a-- ] increasing number density, it is desirable to set up each above-mentioned factor so that the shearing force by the above-mentioned shear strength test method may be 100g or more as a final standard of this firm attachment force and the exfoliation force by the above-mentioned peel strength test method may be 10g or more. moreover, the hook element front face which has loop-formation 5a and 5a-- in this invention -- receiving -- piloerection processing -- giving -- loop formations 5a and 5a -- some -- pulling out -- some -- rose this morning -- \*\*\*\* -- the engagement force with a hook element can be raised by things. In this case, since the firm attachment force improves, conspicuousness can be raised and the effect on the conspicuousness by piloerection processing can be made to offset by reducing a loop-formation consistency. the permeability according to the JIS-P-8117:gar rhe method by what many detailed bores or hollow holes are prepared for in dispersion as other additional processings as opposed to the hook receptacle element in this invention (not shown) -- 9.0sec(s) / 100ml, and JIS-L-1099:MVTR -- considering as the thing 500 g/m<sup>2</sup> and more than d also has the desirable moisture permeability by law (calcium chloride method).

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[Translation done.]

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3. In the drawings, any words are not translated.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the wearing condition perspective view of a disposable diaper.

[Drawing 2] It is the development view of a product.

[Drawing 3] It is an important section cross-sectional view in the condition of having removed the zipper tape.

[Drawing 4] It is an important section cross-sectional view in the condition of having tacking carried out of the zipper tape.

[Drawing 5] It is an important section cross-sectional view in the condition of having removed the zipper tape of other examples.

[Drawing 6] It is the wearing condition perspective view of the disposable diaper of other examples.

[Drawing 7] It is the sectional view of a front seat.

[Drawing 8] It is the sectional view of a front seat.

[Drawing 9] It is the wearing condition perspective view of the disposable diaper of other examples.

[Drawing 10] It is the important section expansion top view of the front seat concerning this invention.

[Drawing 11] It is the important section expansion top view of the conventional front seat.

[Drawing 12] It is the point explanatory view of a shear strength test method.

[Drawing 13] It is the point explanatory view of a peel strength test method.

[Description of Notations]

1 [ -- A hook receptacle sheet, 6 / -- A main tape member, 7 / -- A subtape member, 8 / -- A hook sheet, 9 / -- A target, 10 / -- A printing film, 11 / -- Hot melt adhesive, 12 / -- Heat joining layer. ] -- A top sheet, 2 -- A backseat, 3 -- An absorber, 5

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[Translation done.]

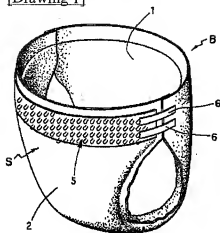
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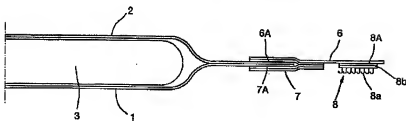
## DRAWINGS

[Drawing 1]

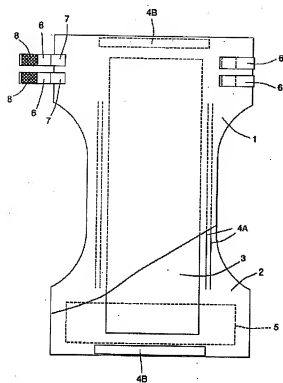


[Drawing 3]

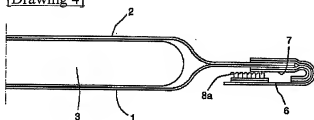
【図3】



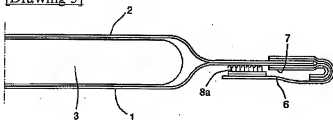
[Drawing 2]



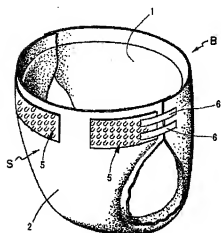
[Drawing 4]



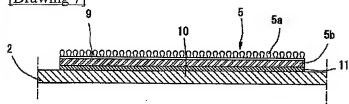
[Drawing 5]



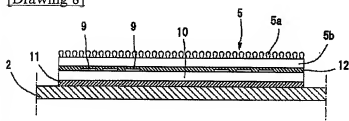
[Drawing 6]



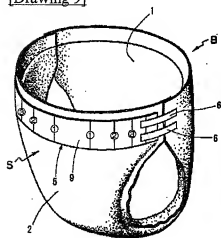
[Drawing 7]



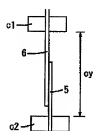
[Drawing 8]



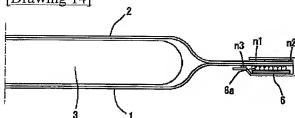
[Drawing 9]



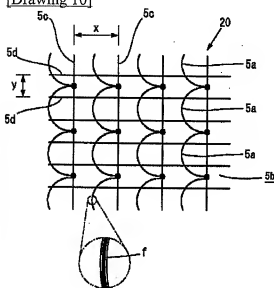
[Drawing 12]



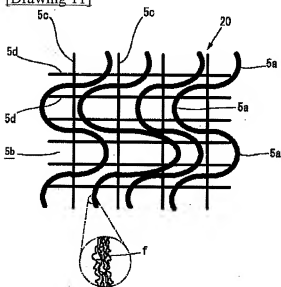
[Drawing 14]



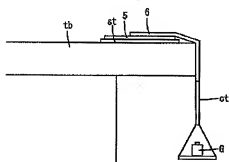
[Drawing 10]



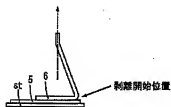
[Drawing 11]





[Drawing 13]  
(a)

(b)



[Translation done.]

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## WRITTEN AMENDMENT

----- [a procedure revision]

[Filing Date] April 20, Heisei 13 (2001. 4.20)

[Procedure amendment 4]

[Document to be Amended] Specification

[Item(s) to be Amended] Whole sentence

[Method of Amendment] Modification

[Proposed Amendment]

[Document Name] Specification

[Title of the Invention] The disposable diaper which has a front seat for firm attachment

[Claim(s)]

[Claim 1] In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter using the surface fastener by the combination of a hook element, this, and the hook receptacle element that has the relation which can be engaged and released, and is made into the fixed means at the time of wearing to a wearer,

Said hook receptacle element consists of the base material section which has the target which can be checked by looking from a front-face side, and a loop formation of a large number fixed to the front face of this base material section,  
each aforementioned loop formation is straight -- again -- \*\* -- it was formed from the filament yarn curved gently

The disposable diaper which has the front seat for firm attachment characterized by things.

[Claim 2] The disposable diaper which has the front seat for firm attachment according to claim 1 with which 10-60 number density /of said loop formation was set to 2 cm.

[Claim 3] In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter using the surface fastener by the combination of a hook element, this, and the hook receptacle element that has the relation which can be engaged and released, and is made into the fixed means at the time of wearing to a wearer,

Said hook receptacle element consists of the base material section which has the target which can be checked by looking from a front-face side, and a grid reticulum which was fixed to the front face of this base material section and which was composed so that many loop formations might bulge,  
a grid reticulum including said loop formation is straight -- again -- \*\* -- it was formed from the filament yarn curved gently

The disposable diaper which has the front seat for firm attachment characterized by things.

[Claim 4] The disposable diaper which has the front seat for firm attachment according to claim 3 with which warp partial spacing in said grid reticulum was set to 1.5mm or less, and weft partial spacing was set to 3.0mm or less while 10-60 number density /of said loop formation was set to 2 cm.

[Claim 5] A disposable diaper given in any 1 term of claims 1-4 which is making the gestalt which bulge and is in sight in the same direction of said loop formation predetermined 60% or more when said hook receptacle element is seen superficially.

[Claim 6] The disposable diaper with which light transmittance of said hook receptacle element simple substance was made into 60% or less and which has the front seat for firm attachment of a publication in any 1 term of claims 1-5.

[Claim 7] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-6 which fixed said loop formation to said base material section with polyurethane adhesive.

[Claim 8] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-7 made into the thing of the design to which said target expresses two or more different firm attachment locations in the direction of a periphery.

[Claim 9] The disposable diaper with which the target to said base material section has the front seat for firm attachment of a publication in any 1 term of claims 1-8 formed of gravure or flexographic printing.

[Claim 10] The shearing force which becomes settled as force of taking the front face of said hook element attached firmly to mutual [ by the shear strength test method ] and the front face of said hook receptacle element to shift relatively [ direction / along both front faces ] is 100g or more,

The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose exfoliation force which becomes settled as force taken to tear off the front face of said hook element attached firmly to mutual [ by the peel strength test method ] and the front face of said hook receptacle element in the direction which intersects perpendicularly with both front faces is 10g or more.

[Claim 11] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-10 whose sound when exfoliating said hook element attached firmly mutually and said hook receptacle element is 15.0 sones or less.

[Claim 12] The disposable diaper with which the permeability according [ said hook receptacle element ] to the JIS-P-8117:gar rhe method has the front seat for firm attachment of a publication in any 1 term of claims 1-11 made into 9.0sec / thing 100ml or more.

[Claim 13] The disposable diaper with which the moisture permeability according [ said hook receptacle element ] to the JIS-L-1099:MVTR method has the front seat for firm attachment of a publication in any 1 term of claims 1-12 made into the thing 500 g/m<sup>2</sup> and more than d.

[Claim 14] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-13 which performed pileorection processing to the hook receptacle element front face which has said loop formation.

[Claim 15] each loop formation of non-crimp processing is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-14 currently formed from the filament yarn curved gently.

[Claim 16] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-15 whose quality of the materials of filament yarn are nylon.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the disposable diaper with which it equipped using the surface fastener (usually called the Velcro fastener (trademark) or a piece of Velcro (trademark)) which can be detached and attached, and which performs engagement to a hook element and a hook carrier element.

[0002]

[Description of the Prior Art] Generally, the thing using the binder as a tape fastener in the case of equipping the person for covering with a disposable diaper is making the mainstream. He is trying to join together with the above-mentioned surface fastener in a diaper cover. When using this surface fastener, many times attachment and detachment are possible, and it is convenient. On the other hand, an adhesive tape fastener is fixed to the both-sides section of a disposable diaper, a front seat is fixed to the

backseat front face of the venter of a disposable diaper with a large area, an adhesive tape fastener is attached firmly to this front seat, and the thing of the structure which can readjust an attaching position is used widely. In this case, what kept spacing in the direction of the circumference of an antinode of a front tape, and formed the target (mark) by printing for the facilities of the firm attachment location of an adhesive tape fastener is known. Although the thing of the structure which attached the adhesive tape fastener firmly to the front seat has the advantage which can adjust the attaching position of a tape fastener, after once removing after wear and checking the existence of urination, when it fixes to a front seat, the firm attachment reinforcement of a binder falls again. Furthermore, originally, in order to depend on the bond strength by the binder, in the disposable diaper for the adult who has a large area, it becomes insufficient [ reinforcement ], and is easy to produce peeling.

[0003] If this point and a surface fastener are used, even if large engagement reinforcement will be obtained and it will repeat attachment and detachment, there is an advantage that there is no fall of engagement reinforcement. As a surface fastener in this case, a hook element consists of a projection of the shape of much reverse RE character, or fungoid, a hook receptacle element consists of a loop formation of an abbreviation semicircle arc of a large number by which both ends were fixed to the base material section front face, and, generally what both elements can detach and attach freely mechanically not by adhesion or chemical association but by tangle (exfoliation) is used. And the filament yarn (a single filament is illustrated by f) with which crimp processing (bulky processing) was performed as loop-formation 5a and 5a-- is used, and a firm tangle to a hook element is realized by the loft so that it may expand to drawing 11 and may be shown conventionally. Moreover, when replacing with a front tape in this way and using a surface fastener, what formed the aforementioned target in base material section 5b is marketed.

[0004]

[Problem(s) to be Solved by the Invention] However, with the hook receptacle element of the conventional surface fastener, as "dimension height of the yarn which constitutes a loop formation" showed to drawing 11 , even if the target (not shown) of a base material section 5b front face will be concealed by much loop-formation 5a of a base material section front face, and 5a-- in dispersion and it mainly gave the character, a design pattern, etc. as a target by them, there was a trouble that it could not be seen vividly.

[0005] Therefore, the technical problem of this invention is one of those which make a field zipper tape the firm attachment means of a disposable diaper, and is to make legible the target of the base material section of a hook receptacle element. Other technical problems are also in the front seat part for firm attachment to offer the product which has permeability.

[0006]

[Means for Solving the Problem] According to the place which this invention persons studied wholeheartedly, it became clear that there were mainly "dimension height of the yarn which constitutes a loop formation", "the number density (the number of the loop formations per unit area) of a loop formation", and "regularity of loop-formation arrangement" as a factor which influences the conspicuousness of the base material section target in the hook receptacle element which has a loop formation. Hereafter, it explains in order of.

[0007] First, "dimension height of the yarn which constitutes a loop formation" is considered to influence the conspicuousness of a target most. Concealment area becomes it excessive that the yarn which constitutes a loop formation like before is filament yarn (refer to the limb of drawing 11 ) by which crimp processing was carried out, and a lower target becomes hard to see. Although it is hard to decide uniquely since the size of a loop formation is filament yarn, all the abbreviation for the loop formation [ a large number in elegance ] by which crimp processing was carried out serves as about 400 micrometers or more of sizes conventionally. Next, if it exceeds 60 2 [ / ] cm in general, when it will exceed 50 2 [ / ] cm especially, a concealment operation comes to be conspicuous about "number density of a loop formation", in viewing. Moreover, even if a loop formation is too sparse on the contrary, only it comes to be conspicuous and there is an inclination for a lower target to become hard to see. therefore, number density -- 10 piece/cm2 -- suitable -- 30 piece/cm2 -- it carries out to two or more [ 40 /cm ]

suitably especially.

[0008] Furthermore, "the regularity of loop-formation arrangement" is important. If loop-formation 5a and 5a-- is regularly arranged as it is shown in drawing 10 to being hard coming to be visible more than an actual concealment rate, when loop-formation 5a and 5a-- is arranged at random, as an a large number loop formation shows drawing 11, it will be easy to assume a concealment part and will sense more legible than an actual concealment rate. The base material section was seen superficially, and if 80 - 90% or more is making especially the gestalt which bulge and is in sight in the same predetermined direction 60% to 70% or more of the a large number loop formation, specifically, it will have become clear that it senses more legible than the actual concealment rate by the loop formation. In addition, when the die length of one loop formation related to "the die length of a loop formation" exceeds especially 2mm 3mm, the concealment operation by itself comes to be conspicuous in this the "regularity of loop-formation arrangement", in viewing. Moreover, since fiber becomes [ a rose \*\*\*\* loop formation ] thicker as mentioned above since the restraint which the concealment area of itself also becomes large and is produced by immobilization in the base material section stops acting on the whole loop formation when a loop formation becomes long, or a free part becomes long, it deforms into an irregular form by the ability of a loop formation to be twisted, and it becomes arrangement irregular as a whole, and is hard coming to be visible more than an actual concealment rate.

[0009] On the other hand, as a front seat in an actual disposable diaper, as shown in drawing 10 or drawing 11, the hook receptacle element which consists of a grid reticulum 20 which was fixed to the front face of base material section 5b to which the target was given, and this base material section 5b, and which was composed so that much loop-formation 5a and 5a-- might bulge is used. Thus, with the gestalt of loop-formation 5a to base material section 5b, and 5a-- with which adhesive strength is compensated by the grid reticulated part, "dimension height of warp partial 5c and 5d of weft parts", and "warp partial spacing and weft partial spacing" in grid reticulated material influence the conspicuousness of the target of base material section 5b. The effect of latter is the same as that of the number density of a loop formation.

[0010] Thus, although it turns out that all the above-mentioned factors are acting in multiplication when it sees, the dimension height of a loop formation and the effect of number density are large especially too. However, when dimension height of the loop formation in the conventional hook receptacle element is only lessened or number density is only lessened, the engagement force with a hook element declines and an original firm attachment function may be spoiled. When number density is raised too much, it becomes impossible for this trouble to solve the problem of spoiling the conspicuousness of a base material section target on the contrary, although it is solvable by raising the number density of a loop formation.

[0011] This invention is made based on these knowledge, and the configuration of degree account is used for it.

The surface fastener by the combination of a <according to claim 1 invention> hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element it consists of the base material section which has the target which can be checked by looking from a front-face side, and a loop formation of a large number fixed to the front face of this base material section, and each aforementioned loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently. the <operation effectiveness> -- as the yarn with which invention according to claim 1 constitutes a loop formation -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- by using the filament yarn curved gently, even when the yarn of the number of the same filament is used, remarkably, concealment area becomes small and a target becomes more legible. A target can be made more legible, without dropping reinforcement, without [ therefore ] this changing the size and number of filament yarn.

[0012] <Invention according to claim 2> Disposable diaper with which the number density of said loop formation has the front seat for firm attachment according to claim 1 set to 2 cm 10-60 pieces / the <operation effectiveness> -- considering as this loop-formation number density range -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- even if it uses the filament yarn curved gently, sufficient firm attachment force is demonstrated. Moreover, if the number density of a loop formation is in this range, and it glances, it will be thought that a masking effect becomes large by dense arrangement, but since it is visible to the feeling of a material of the base material section itself closely when it actually views, a lower target becomes legible on the contrary rather than elegance conventionally by which the loop formation has been arranged at non-denses.

[0013] The surface fastener by the combination of a <according to claim 3 invention> hook element, this, and the hook receptacle element that has the relation which can be engaged and released is used. In the disposable diaper which fixes the hook element of said surface fastener to the both-sides section of a disposable diaper backside, fixes a hook receptacle element to a venter, and is made into the fixed means at the time of wearing to a wearer said hook receptacle element Were fixed to the front face of the base material section which has the target which can be checked by looking from a front-face side, and this base material section. the grid reticulum which consists of a grid reticulum composed so that many loop formations might bulge, and includes said loop formation is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment characterized by what was formed from the filament yarn curved gently.

the <operation effectiveness> -- all the yarn with which invention according to claim 3 exists on the base material section about the example which compensates the adhesive strength of a loop formation to the base material section with a grid reticulated part as mentioned above in this case -- crimp processing -- or non-crimp processing is preferably straight -- again -- \*\* -- the target of the lower base material section can be made legible by considering as the filament yarn curved gently.

[0014] <Invention according to claim 4> Disposable diaper which has the front seat for firm attachment according to claim 3 with which warp partial spacing in said grid reticulum was set to 1.5mm or less, and weft partial spacing was set to 3.0mm or less while 10-60 number density /of said loop formation was set to 2 cm.

The <operation effectiveness> In this way, while setting 10-60 number density /of a loop formation to 2 cm, by forming a loop formation and a grid densely rather than elegance conventionally, setting warp partial spacing to 1.5mm or less, and using weft partial spacing as 3.0mm or less, like invention according to claim 2, a lower target becomes legible on the contrary, and the bond strength to the base material section and the advantage which becomes high are brought about.

[0015] <Invention according to claim 5> Disposable diaper given in any 1 term of claims 1-4 which is making the gestalt which bulge and is in sight in the same direction of said loop formation predetermined 60% or more when said hook receptacle element is seen superficially.

The <operation effectiveness> It becomes easy to be visible more than a concealment rate actual as mentioned above with [ a loop formation ] regular arrangement in this way.

[0016] <Invention according to claim 6> Disposable diaper with which light transmittance of said hook receptacle element simple substance was made into 60% or less and which has the front seat for firm attachment of a publication in any 1 term of claims 1-5.

The <operation effectiveness> The target of the base material section will become legible by making light transmittance into the above-mentioned range, combining the above-mentioned this invention configuration suitably.

[0017] <Invention according to claim 7> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-6 which fixed said loop formation to said base material section with polyurethane adhesive.

The <operation effectiveness> By using these adhesives, the feeling of gloss of a base material section front face can be stopped, it has, and the target of the base material section becomes more legible.

[0018] <Invention according to claim 8> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-7 made into the thing of the design to which said target

expresses two or more different firm attachment locations in the direction of a periphery.

The <operation effectiveness> By giving this design, there is an advantage which the standard of the bolting degree at the time of firm attachment comes to understand easily.

[0019] <Invention according to claim 9> Disposable diaper with which the target to said base material section has the front seat for firm attachment of a publication in any 1 term of claims 1-8 formed of gravure or flexographic printing.

It recommends forming using gravure or flexographic printing as a target of <operation effectiveness> this invention.

[0020] The front face of said hook element attached firmly to mutual [ by the <according to claim 10 invention> shear strength test method ], and the front face of said hook receptacle element The shearing force which becomes settled as force taken to shift relatively [ direction / along both front faces ] is 100g or more. The front face of said hook element attached firmly to mutual [ by the peel strength test method ], and the front face of said hook receptacle element The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-9 whose exfoliation force which becomes settled as force taken to tear off in the direction which intersects perpendicularly with both front faces is 10g or more.

The <operation effectiveness> Although the target under it can be made legible by the above-mentioned configuration though the firm attachment force by the loop formation is fully maintained, it is desirable to design so that it may have the shearing force and the exfoliation force of the above-mentioned range as concrete firm attachment force.

[0021] The "shear strength test method" and the "peel strength test method" which are said to this invention are defined here as follows.

(b) shear strength test method

\*\* As shown in drawing 12 , stick the whole partial surface which has the hook of the hook element 8 cut out from the product to the hook receptacle element (front seat) 5 cut out from the disposable diaper product to 40mmx100mm. At this time, like [ the sense of the hook receptacle element 5 to the hook element 8 ] the time of product use, it sticks so that the lengthwise direction in the product condition of the hook receptacle element 5 and the lengthwise direction in the product condition of the hook element 8 may become parallel.

\*\* After an appropriate time, it is the posture in which the longitudinal direction in a product condition meets a lengthwise direction, and to the chuck c1 on a tension tester, adjust so that the vertical chuck c1 and the distance cy between c2 may be set to 50mm, and a lower chuck pinches a non-engage part [ in / for the end face section which does not have the hook in the hook element 8 / the hook receptacle element 5 ], and measure by it by pull to a shear direction by speed of testing 300 mm/min.

\*\* The peak of the beginning of the obtained chart is read and let this be the shear strength.

[0022] (b) Peel strength test method

\*\* As shown in drawing 13 , make into a table the side which has a loop formation for the hook receptacle element (front seat) 5 cut out from the disposable diaper product to 40mmx100mm, and stick a rear face on a stainless plate st with a double-sided tape. A front face fixes to a stainless plate st from \*\* the edge which is not being fixed on the Kraft tape.

\*\* Next, stick the whole partial surface which has the hook of the hook element 8 cut out of a product on the front face of the stuck hook receptacle element 5. At this time, like [ the sense of the hook element 8 to the hook receptacle element 5 ] the time of product use, it sticks so that the lengthwise direction in the product condition of the hook receptacle element 5 and the lengthwise direction in the product condition of the hook element 8 may become parallel. The above-mentioned lengthwise direction is made to carry out 1 \*\*\*\* of rollers with a mass of 2kg, and the hook element 8 and the hook receptacle element 5 are made engaged after an appropriate time.

\*\* Next, these stainless plates st, and 5 and 6 are fixed to the edge of Table tb etc., and the end face section side which does not have the hook of the hook element 8 is bent and hung from tb edge of a table, stick the end section of the Kraft tape ct on the hanging part, attach the 1kg weight G in the other end of the Kraft tape ct, and apply a load for 2 seconds.

\*\* Subsequently, remove a load, carry the hook receptacle element in the condition that the hook element was engaged into the tension tester which is not illustrated with a stainless plate, and measure by the exfoliation include angle of 90 degrees, and speed-of-testing 300 mm/min. This condition is shown in drawing 13 (b).

\*\* Except for maximum and the minimum value, it reads each the maximum peak from the remaining peaks, and the three minimum peaks (a total of six points) in the obtained chart, calculate the average, and make this into shearing force.

[0023] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-10 whose sound when exfoliating said hook element attached firmly to both <invention according to claim 11> and said hook receptacle element is 15.0 sones or less.

If the <operation effectiveness> firm attachment force is raised, since the sound at the time of exfoliation tends to become excessive and tends to become jarring, it is desirable to design so that an exfoliation sound may be settled in the above-mentioned range. The loudness level (sone) said to this invention here is the value which measures the sound at the time of exfoliation with an ordinary sound level meter, assigns this value (phone) at the following type (1), and can be found.

[Equation 1]

$$S_{(y-y)} = 2^{\frac{P(\text{ㇿ}) - 40}{10}} \dots (1)$$

[0024] <Invention according to claim 12> Disposable diaper with which the permeability according [ said hook receptacle element ] to the JIS-P-8117:gar rhe method has the front seat for firm attachment of a publication in any 1 term of claims 1-11 made into 9.0sec / thing 100ml or more.

If it is in the range which requires the <operation effectiveness> permeability, even if it prepares a hook receptacle element in a venter, sufficient permeability will be secured, and it will become that it is hard to make a wearer sense displeasure. When also giving permeability to a non-liquid-permeable nature sheet, the permeability in the part of the front seat for firm attachment is not spoiled.

[0025] <Invention according to claim 13> Disposable diaper with which the moisture permeability according [ said hook receptacle element ] to the JIS-L-1099:MVTR method has the front seat for firm attachment of a publication in any 1 term of claims 1-12 carried out to more than 500g/m ] 2 and d.

If it is in the range which requires the <operation effectiveness> moisture permeability, even if it prepares a hook receptacle element in a venter, sufficient moisture permeability will be secured, and it will become that it is hard to make a wearer sense displeasure. When also giving moisture permeability to a non-liquid-permeable nature sheet, moisture permeability in the part of the front seat for firm attachment is not spoiled.

[0026] <Invention according to claim 14> Disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-13 which performed piloerection processing to the hook receptacle element front face which has said loop formation.

The <operation effectiveness> By performing this piloerection processing, a loop formation is pulled out and the engagement force with a hook element improves by that of rose \*\*\*\*. In this case, although a target becomes hard to see a little rather than what does not perform piloerection processing, conspicuousness can be raised and the effect on the conspicuousness by piloerection processing can be made to offset by [ which use the filament yarn which performed crimp processing ] reducing a loop-formation consistency, since it is more remarkably [ conventionally / than elegance ] legible and the firm attachment force improves by piloerection processing.

[0027] <according to claim 15 invention> each loop formation of non-crimp processing is straight -- again -- \*\* -- the disposable diaper which has the front seat for firm attachment of a publication in any 1 term of claims 1-14 currently formed from the filament yarn curved gently.

[0028] The disposable diaper which has the front seat for firm attachment of a publication in any 1 term



of claims 1-15 whose quality of the materials of <according to claim 16 invention> filament yarn are nylon.

the <operation effectiveness> -- straight -- again -- \*\* -- the filament yarn curved gently excels [ thing / of non-crimp processing ] in visibility. Moreover, it excels that the quality of the material of filament yarn is nylon in respect of the firm attachment nature of a hook element etc.

[0029]

[Embodiment of the Invention] It explains in full detail further, referring to the gestalt of the operation which shows this invention below to a drawing. Drawing 1 - drawing 4 are what showed the 1st example. The body of a disposable diaper The liquid permeability top sheet 1 which consists of a nonwoven fabric by the side of a front face (field equivalent to the skin) etc., The non-liquid-permeable nature backseat 2 which consists of a poly lamination nonwoven fabric which consists of a polyethylene sheet on the back etc., and with which an inside side consists of a polyethylene sheet etc. more preferably, and an external surface side consists of a nonwoven fabric, The absorber 3 which consists of curdy pulp which left the perimeter part as the flap section and intervened among them is used as the basic component. It is desirable to use what gave this permeability and moisture permeability by forming many fine needle holes here for the non-liquid-permeable nature backseat 2 which consists of a poly lamination nonwoven fabric.

[0030] An absorber 3 is adjoined and 1 or two or more elastic flexible member 4A is prepared in the circumference part of a foot as occasion demands. Elastic flexible member 4B for order leakage prevention is prepared in an order edge as occasion demands. The gestalt of illustration is more desirably established as barrier cuffs (called standing-up cuffs), although an absorber 3 is adjoined and 1 or two or more elastic flexible member 4A is prepared in the circumference part of a foot as flat-surface gathers.

[0031] Although this kind of body of a disposable diaper is well-known, in this invention, the hook receptacle sheet (slag carrier sheet) 5 which constitutes the hook receptacle element with which much loop-formation 5a projects in base material 5b is fixed to the external surface of Abdomen S by the non-liquid-permeable nature backseat 2 as the so-called front seat. However, loop-formation 5a of the hook receptacle sheet 5 shown in drawing 1 has opted for size or arrangement, in order to make a drawing legible, and it does not have correlation with the range of this invention mentioned later.

[0032] On the other hand, other one element of a surface fastener is being fixed to \*\*\*\*\* for Back B. In the example, \*\*\*\*\* is constituted by a backseat 2 and the top sheet 1, Back B juts over the front face of a backseat 2 out of the side edge at the method of outside, binder layer 6A is fixed and the subtape member 7 is formed [ the main tape member 6 ] for both ends by binder layer 7A in the state of immobilization between the front-face side of the top sheet 1, and the inside side of the main tape member 6 over the side edge. The hook sheet 8 which constitutes the hook element of a surface fastener is being fixed to a part for the inside flank in which the subtape member 7 of said main tape member 6 does not exist by for example, binder layer 8A. The hook sheet 8 implants much piece of hook 8a in base material 8b, and piece of hook 8a has the relation in which said loop-formation 5a and engaging and releasing are free. Moreover, preferably, by preparing inside from the tip of the main tape member 6, the hook sheet 8 pinches a point and has left it as the section.

[0033] On the other hand, it consider as the condition of having fold up the main tape member 6 inside the product at the time of un-equip, and be engage with the fiber of the top sheet 1 as for which the hook sheet 8 consist of a nonwoven fabric in the location exceeding the subtape member 7 whole in that case as be show at a part of subtape member 7 or drawing 5 in the condition of having been involved free [ exfoliation ] as show in drawing 4 . While fixing only the end face section and the side edge section of a backseat 2, and a corresponding part to a backseat 2 through the binder layers n1 and n2 only using the main tape member 6 as shown in drawing 14 in order to lessen configuration parts more The adhesion material layer n3 is formed in the pars intermedia by the side of a tip rather than the piece of hook 8a part in the main tape member 6, and where the main tape member 6 is folded up inside a product at the time of un-equipping, it can also fix to the product inside by the binder layer n3 of a point.

[0034] After the main tape member 6 which has the hook sheet 8, and the subtape member 7 are

attached in the body of a disposable diaper in this disposable diaper, as shown in drawing 4 The main tape member 6 is made into the condition of having folded up inside the disposable diaper, the hook sheet 8 is twined around the fiber of the top sheet 1 which consists of a nonwoven fabric in the location exceeding a part of subtape member 7, and it is engaged, and a production process is advanced further and shipped after making a load. At the time of wearing of a disposable diaper, the tip of the main tape member 6 is gathered, the hook sheet 8 is exfoliated from the top sheet 1, the extension part is carried into Venter S, and the hook sheet 8 is piled up on the hook receptacle sheet 5. Association before and behind a disposable diaper is made for each piece of hook 8a by this superposition involving each loop-formation 5a. What is necessary is to remove the extension section of the hook sheet 8 from the hook receptacle sheet 5, and just to recombine it on the occasion of the check of the existence of urination, or redo of wearing.

[0035] In the above-mentioned example, although the hook sheet 8 was fixed to the main tape member 6 in binder 8A, base material 8b of the hook sheet 8 can also be fixed to the main tape member 6 by heat joining etc., without being based on binder layer 8A. The hook sheet 8 can keep spacing along with the longitudinal direction of the main tape member 6, and can also prepare it. [ two or more ] although two zipper tapes of the main tape member 6 which has the hook sheet 8, and the subtape member 7 were prepared to one both-sides section of a disposable diaper, they can be made into one (or the applications for small children etc. -- responding), or 3 or more according to bonding strength, as shown in drawing 1 and drawing 2 . Moreover, as shown in drawing 6 , the hook receptacle sheet 5 may be arranged to a venter corresponding to an individual exception.

[0036] In this invention, the hook receptacle sheet 5 which constitutes the hook receptacle element with which much loop-formation 5a projects on a base material section 5b front face as a cross section shows to drawing 7 is fixed with hot melt adhesive 11 on the non-liquid-permeable nature backseat 2 as above-mentioned. In this case, after giving a target directly to the front face of the base material sheet which constitutes base material section 5b with well-known printing means, such as gravure and flexographic printing, like illustration, it is desirable to fix a loop formation to that front face by hot melt adhesive etc. A target can also be attached to the rear face of a base material sheet, and the base material sheet itself is formed for transparency or a translucent material in that case. As this base material sheet 5b, things with a thickness of 25 micrometers or less also including printing thickness are desirable, and polyethylene is desirable as the quality of the material.

[0037] Moreover, as a cross section shows, the hook receptacle sheet 5 is not directly fixed to drawing 8 at the non-liquid-permeable nature backseat 2. In the location which should fix the hook receptacle sheet 5, the printing film 10 with which the target 9 of the firm attachment location of said hook sheet 8 was printed at the external surface side For example, while fixing to the non-liquid-permeable nature backseat 2 with hot melt adhesive 11 and carrying out the laminating (sign 12 shows heat joining layer) unification of the hook receptacle sheet 5 by heat joining on the printing film 10 The hook receptacle sheet 5 can also be made transparent or translucent in order to make it said target 9 appear from the outside. In this case, the printing film 10 also constitutes the base material section of this invention. In this way, the check by looking of said target 9 is attained from the exterior through the hook receptacle sheet 5, and the firm attachment location of said hook sheet 8 can be chosen according to a target 9. It is desirable to be able to display by the figure, the mark, the classification-by-color band, or the line, and to form the target 9 which consists of a band-like design classified by color so that two or more firm attachment locations which are different in the direction of a periphery as shown in drawing 9 might be expressed especially by these as a target 9. In addition, in drawing 9 , classification by color and a loop formation are omitted for the conspicuousness of a drawing. However, in this invention, many loop formations are established on the hook receptacle sheet 5 like the following \*\*.

[0038] and as this invention especially shows a flat surface to drawing 10 , non-crimp processing is straight in all loop-formations 5a and 5a-- again -- \*\* -- it forms with the filament yarn curved gently. When the filament yarn which consists of a filament of a size comparable as elegance conventionally is used, all abbreviation is set to about 200 micrometers or less although it cannot generally crawl on the size of a loop formation. it starts in this invention -- straight -- again -- \*\* -- by using the filament yarn

curved gently, compared with the contrast Fig. of the conventional article of drawing 11, the concealment area by loop formations 5a and 5a becomes remarkably small so that clearly, and the target 9 of base material section 5b becomes legible in spite of existence of loop-formation 5a and 5a-- however -- since the engagement force with a hook becomes weak by having not carried out crimp processing to it being only this -- the number density of loop-formation 5a and 5a-- 10-60 -- it is suitably desirable 2 and to carry out to two or more [ 40-50 //cm ] suitably especially cm 30-60 pieces /. If it is in the range of loop-formation 5a and 5a-- which requires number density, not to mention it will spoil the conspicuousness of the lower target 9 as above-mentioned, it becomes legible on the contrary.

[0039] Moreover, base material section 5b which has like illustration the target 9 which can be checked by looking from a front-face side, In using the hook receptacle element which consists of a grid reticulum which was fixed to the front face of this base material section 5b, and which was composed so that much loop-formation 5a might bulge non-crimp processing is straight in the whole (namely, warp partial 5c, 5d of weft parts, all of loop-formation 5a) grid reticulum -- again -- \*\* -- if it forms with the filament yarn curved gently, the target 9 of lower base material section 5b will become legible. In this case, not to mention it spoils the conspicuousness of the lower target 9 as above-mentioned by making especially 0.7-1.3mm and the weft partial spacing x for the warp partial spacing y in the grid reticulum 20 of loop-formation 5a and 5a-- while making number density with the above-mentioned range with 1.5-1.8mm 3.0mm or less 1.5mm or less, it becomes legible on the contrary. In this case, as for the superintendent officer of a grid reticulum, it is desirable that it is 25.0 - 34.0 g/m<sup>2</sup>.

[0040] Especially nylon is desirable although about ten thin filaments f are bundled here so that filament yarn may be expanded and it may be shown, and polyethylene terephthalate (PET), nylon, etc. can use all well-known things as the quality of the material here. As a color of filament yarn, the thing of white, translucence, or transparency is desirable. In order to make legible the target 9 of base material section 5b furthermore, when a hook receptacle element is seen superficially, it is desirable that 80 - 90% or more makes especially the gestalt of loop-formation 5a which bulges and (it bulges on left-hand side to the direction of warp in drawing) looks in the same predetermined direction like illustration 60 to 70% or more. For this reason, it is desirable to make it a loop formation not deform irregularly the one die length of loop-formation 5a especially as 2mm or less 3mm or less. Moreover, it is desirable for there to be light transmittance of a hook receptacle element simple substance, and to make it this become 60% or less by this invention as a standard of final conspicuousness. In illustration, loop formations 5a and 5a fix to base material section 5b with hot melt adhesive with a grid reticulum. In this case, as hot melt adhesive to be used, although a rubber system, a styrene system, and polyurethane adhesive can be used, if polyurethane adhesive is used especially, a feeling of gloss will decrease and a target will become legible more. Especially as coverage of these adhesives, 4.0 - 5.0 g/m<sup>2</sup> is desirable two or more 3.5 g/m.

[0041] On the other hand, as mentioned above, although it can avoid spoiling the fall of the firm attachment force (engagement force) by [ of loop-formation 5a and 5a-- ] increasing number density, it is desirable to set up each above-mentioned factor so that the shearing force by the above-mentioned shear strength test method may be 100g or more as a final standard of this firm attachment force and the exfoliation force by the above-mentioned peel strength test method may be 10g or more. moreover, the hook element front face which has loop-formation 5a and 5a-- in this invention -- receiving -- piloerection processing -- giving -- loop formations 5a and 5a -- some -- pulling out -- some -- rose this morning -- \*\*\*\* -- the engagement force with a hook element can be raised by things. In this case, since the firm attachment force improves, conspicuousness can be raised and the effect on the conspicuousness by piloerection processing can be made to offset by reducing a loop-formation consistency, the permeability according to the JIS-P-8117:gar rhe method by what many detailed bores or hollow holes are prepared for in dispersion as other additional processings as opposed to the hook receptacle element in this invention (not shown) -- 9.0sec(s) / 100ml, and JIS-L-1099:MVTR -- considering as the thing 500 g/m<sup>2</sup> and more than d also has the desirable moisture permeability by law (calcium chloride method).

[0042]

[Effect of the Invention] According to this invention the above passage, it is in some which make a field zipper tape the firm attachment means of a disposable diaper, and the target of the base material section of a hook receptacle element becomes legible in spite of concealment by the loop formation.

[Brief Description of the Drawings]

[Drawing 1] It is the wearing condition perspective view of a disposable diaper.

[Drawing 2] It is the development view of a product.

[Drawing 3] It is an important section cross-sectional view in the condition of having removed the zipper tape.

[Drawing 4] It is an important section cross-sectional view in the condition of having tacking carried out of the zipper tape.

[Drawing 5] It is an important section cross-sectional view in the condition of having removed the zipper tape of other examples.

[Drawing 6] It is the wearing condition perspective view of the disposable diaper of other examples.

[Drawing 7] It is the sectional view of a front seat.

[Drawing 8] It is the sectional view of a front seat.

[Drawing 9] It is the wearing condition perspective view of the disposable diaper of other examples.

[Drawing 10] It is the important section expansion top view of the front seat concerning this invention.

[Drawing 11] It is the important section expansion top view of the conventional front seat.

[Drawing 12] It is the point explanatory view of a shear strength test method.

[Drawing 13] It is the point explanatory view of a peel strength test method.

[Drawing 14] It is an important section cross-sectional view in the condition of having tacking carried out of the zipper tape.

[Description of Notations]

1 [ -- A hook receptacle sheet, 6 / -- A main tape member, 7 / -- A subtape member, 8 / -- A hook sheet, 9 / -- A target, 10 / -- A printing film, 11 / -- Hot melt adhesive, 12 / -- Heat joining layer. ] -- A top sheet, 2 -- A backseat, 3 -- An absorber, 5

[Procedure amendment 5]

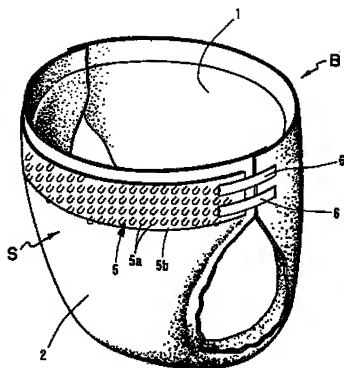
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 1

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 1]



[Procedure amendment 6]

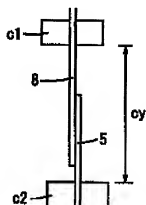
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 12

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 12]



[Procedure amendment 7]

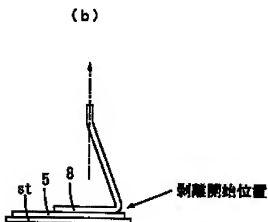
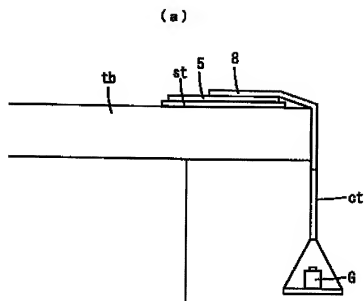
[Document to be Amended] DRAWINGS

[Item(s) to be Amended] drawing 13

[Method of Amendment] Modification

[Proposed Amendment]

[Drawing 13]



[Translation done.]